

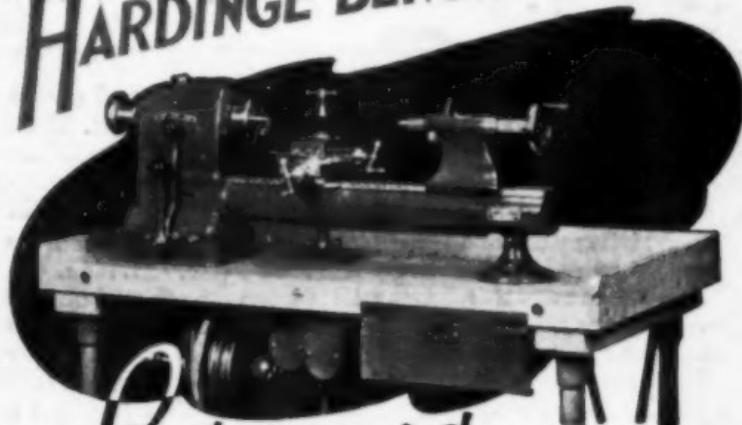
HITCHCOCK'S *Machine Tool* BLUE BOOK

FOUNDED

JULY 1937

190

LABOR SHORTAGE
is compelling the use of
HARDINGE BENCH LATHES



Because —

They permit an ordinary mechanic to do the work of a skilled mechanic — rapidly.

The preloaded ball bearing spindle construction gives complete free high spindle speeds and extreme accuracy. These features insure greater production and lower cost.

*Send Coupon
No. 1 for
Bulletin BB.*

**HARDINGE BROTHERS, INC., - ELMIRA, N.Y.
CHICAGO - NEW YORK - PHILADELPHIA - DETROIT - HARTFORD**

PUBLISHED AT 508 SO. DEARBORN ST., CHICAGO



automatic
production
SAWING
at
Ball
Bearing
Speed

MARVEL

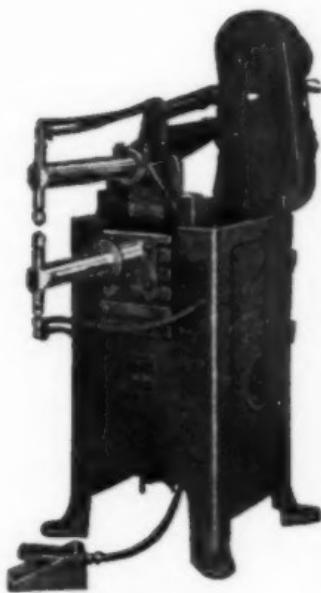
Cutting off has always been slow and costly operation, hard on tools and wasteful of stock. With today's automatic, high-speed MARVEL Saws it has become an easy, fast operation, especially when cutting quantities of identical pieces from bar stock. Requiring no more attention than an automatic screw machine (*Saving labor*), the new MARVEL Nos. SA and QA Production Saws will feed to length and cut-off diameters up to 10 inches at the rate of 10 pieces of 8 inches round or 160 pieces of 1½ inches round every hour floor to floor (*Saving time*). With unbreakable High-Speed Edge Hack Saw Blades that are but a fraction of the width of a cutting-off blade, chip loss between pieces is materially reduced and the number of pieces per bar increased (*Saving stock*).

Built by MARVEL, the pioneer builders of automatic bar push-up machines, and strictly heavy-duty with full ball bearing construction, these saws have solved completely the "cutting off problem".

Send for Catalog No. 6 for complete details.

Armstrong Blum Mfg. Co.
"The Hack Saw People"
5841 Bloomingdale Ave.
Chicago, U. S. A.

TAYLOR-WINFIELD



"N" Type

SPOT WELDER

After 13 Years
Better Than Ever

Over 8000 in use in industry today prove the universal preference of large and small plants for this efficient and extremely flexible welding unit.

Variable Speed Drive standard equipment, providing speed range infinitely adjustable within 3 to 1 limits.

All sizes available in motor-driven, air or manually operated styles.

24-HOUR DELIVERY SERVICE

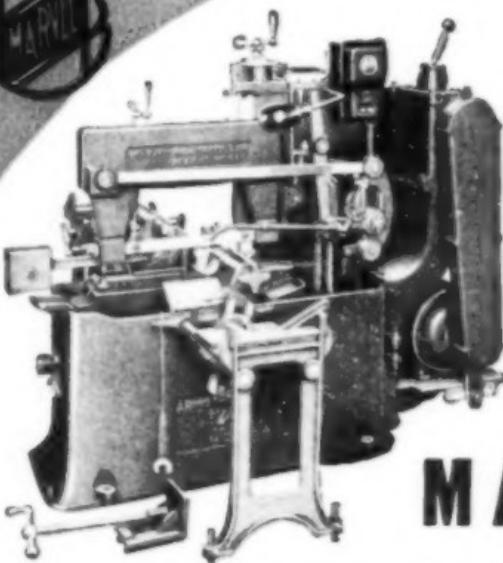
The "N" Type is one of the few welding machines made in sufficient volume to justify the use of jigs and fixtures and "Production Line" assembly methods. This provides interchangeability of parts and enables us to carry all sizes and capacities in stock. A machine ordered today can be shipped tomorrow.

Send Coupon No. 53 for complete information!

THE TAYLOR-WINFIELD CORP'

Main Office and Factory,
1052 Mahoning Ave., N. W.,
Warren, Ohio

Branch Factory,
14307 Third Ave.,
Detroit, Mich.



automatic
production
SAWING
at
Ball
Bearing
Speed

MARVEL

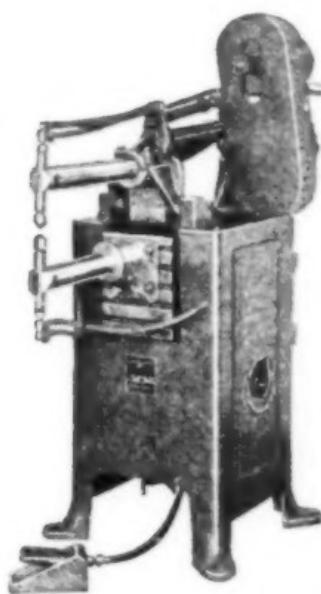
Cutting-off in a lathe has always been a slow and costly operation, hard on tools and wasteful of stock. With today's automatic, high-speed MARVEL Saws it has become an easy, fast operation, especially when cutting quantities of identical pieces from bar stock. Requiring no more attention than an automatic screw machine (*Saving labor*), the new MARVEL Nos. 6A and 9A Production Saws will feed to length and cut-off diameters up to 10 inches at the rate of 10 pieces of 6 inches round or 160 pieces of 1½ inches round every hour floor to floor (*Saving time*). With unbreakable High-Speed Edge Hack Saw Blades that are but a fraction of the width of a cutting-off blade, chip loss between pieces is materially reduced and the number of pieces per bar increased (*Saving stock*).

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"The Hack Saw People"
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Chicago, U. S. A.

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"N" Type

SPOT WELDER

After 13 Years
Better Than Ever

Over 8000 in use in industry today prove the universal preference of large and small plants for this efficient and extremely flexible welding unit.

Variable Speed Drive standard equipment, providing speed range infinitely adjustable within 3 to 1 limits.

All sizes available in motor-driven, air or manually operated styles.

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Send Coupon No. 53 for complete information!

THE TAYLOR-WINFIELD CORP'N

Main Office and Factory,
1052 Mahoning Ave., N. W.,
Warren, Ohio

Branch Factory,
14307 Third Ave.,
Detroit, Mich.

Spring tempered COLLETS

Order From Stock

Scientifically heat treated to a true spring temper, "Rivett Mark" collets resist wear and hold their spring longer than collets of any other make. As standard equipment on all makes of lathes and mills, (see Rivett Bulletin 100B) they may be ordered for immediate delivery from the following stocks —

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300 W. Washington Blvd.

BOSTON
Rivett Lathe & Grinder Inc.
10 Rhenway Road, Brighton

DETROIT
Charles A. Stroninger Co.
140 E. Larned Street



RIVETT

LATHE & GRINDER INC.
BRIGHAM, BOSTON, MASS.

To save time and trouble, use **QUICKMAIL COUPON**
No. 24 when you write for Bulletin 100B.

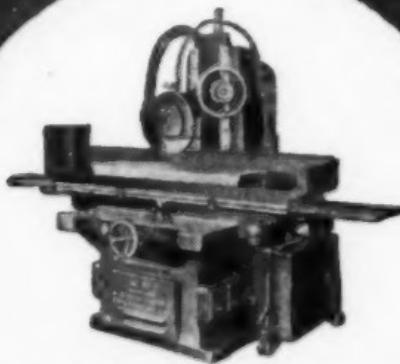
HIGH SPEED HYDRAULIC FEED SURFACE GRINDERS

Time Savings of 50% and More!

One customer reports grinding time reduced from 12 hours to 30 minutes—a prominent automobile manufacturer reduced grinding time on louvre dies from 6½ hours to 35 minutes—a third customer increases production on small typewriter parts over 50%!

Longitudinal table speeds up to a maximum of 125 feet per minute are obtainable on these Grand Rapids High Speed Surface Grinders.

Rugged, one-piece column and base castings guarantee a permanent alignment between vertical head ways and cross saddle ways.



This is No. 65 in the series that covers every requirement. Use Quickmail Coupon No. 72 when you write for Bulletin.

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GALLMEYER & LIVINGSTON CO
305 STRAIGHT AVE., S. W. GRAND RAPIDS, MICH



COLLET AND FEED

Collets for your Lathes and
Milling Machines



All types and sizes carried
in stock for prompt shipment

Collets for your lathes and milling machines when you want them . . . instantly . . . promptly! HARDINGE Collets—recognized for accuracy and durability since 1890—are held in stock in sufficiently large quantities in Elmira, Chicago, New York, Detroit and Los Angeles to insure immediate delivery at any time.

This prompt service includes HARDINGE Collets for American, Burke, Cataract, Flather, Hendey, LeBlond, Monarch, Porter-Cable, Pratt & Whitney, Rockford, Sebastian, Sidney, South Bend, Sundstrand, Van Norman and all other lathes and milling machines.

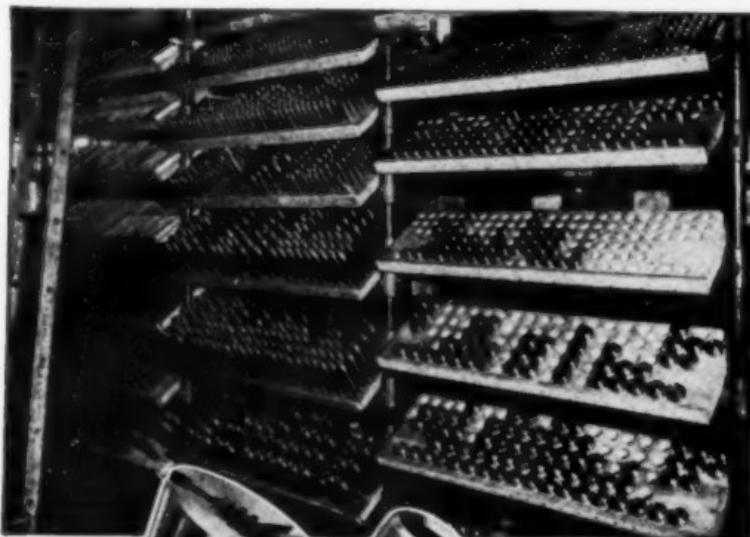
Send Quickmail Coupon No. 2 for bulletin No. 36

—ALWAYS SPECIFY HARDINGE COLLETS—

HARDINGE BROTHERS, Inc. • • • ELMIRA, N. Y.

FINGER SECTION

Collets and Feed Fingers for your
Automatic and Hand Screw Machines



Standard sizes in stock
for immediate delivery

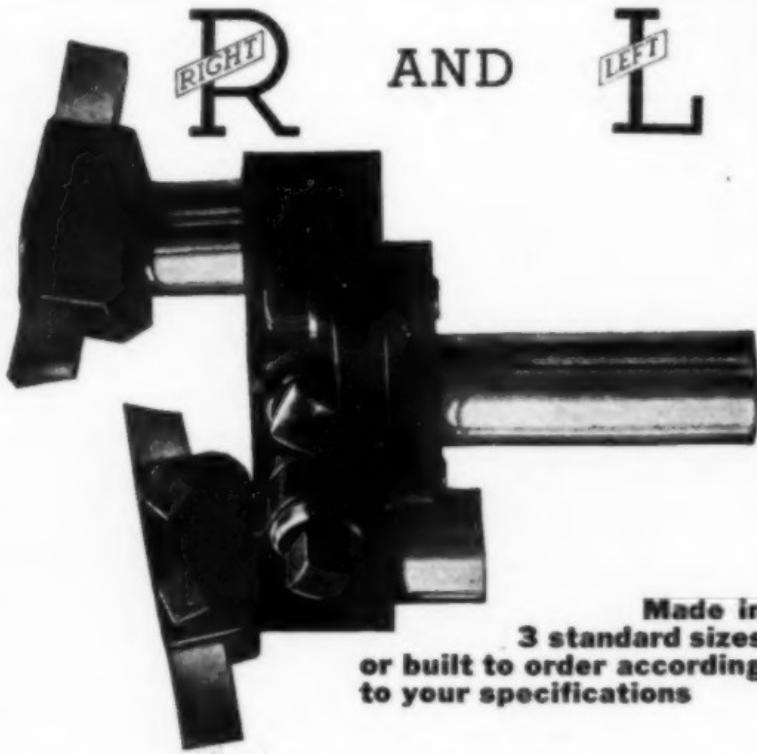
Typical MORRISON quality and quick delivery are planned to meet with the satisfaction of all users of Collets, Feed Fingers and Pads for Brown & Sharpe, Cleveland,

Cone, Gridley, National Acme, New Britain, Davenport and all other automatic screw machines. MORRISON Collets also for Bardons & Oliver, Foster, Garvin, Pratt & Whitney, Warner & Swasey, and all other hand screw machines.

Send Quickmail Coupon No. 3 for catalog No. 34-A

-MORRISON MEANS ECONOMY AND PERFORMANCE-

MORRISON MACHINE PRODUCTS, Inc., ELMIRA, N. Y.



Made in
3 standard sizes
or built to order according
to your specifications

Save On Your Set-Up Costs With This Combination Tool

By using various adjustments, one R & L turning tool can be made to perform a variety of operations, singly or together, thereby saving not only tool costs but time required for setting up machines. Extremely fine adjustments are provided both on the tool and on the pressure of the burnishers.

Ask for complete details

R AND L TOOLS

Turning Tool



Entire tool is made
of heat - treated
alloy steel

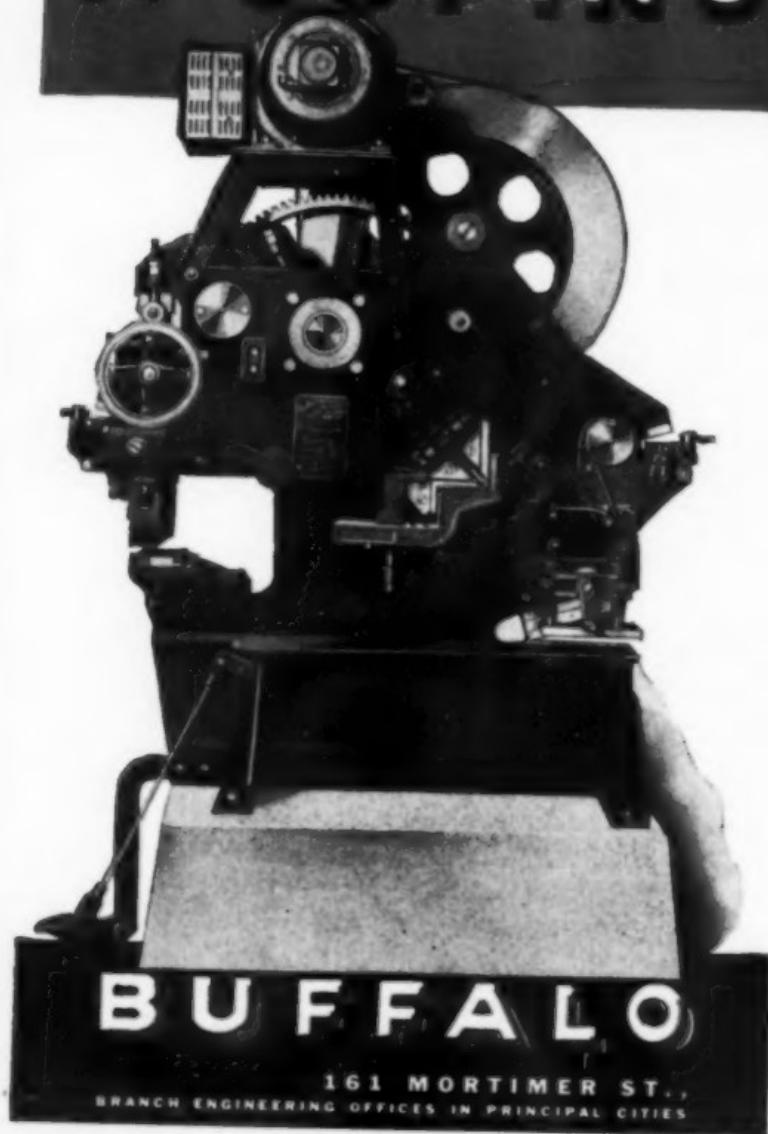
Easily Changed In 10 Seconds For Right Or Left Hand Work

Speed in making set-ups is essential to economy. An R & L Turning Tool can be assembled and adjusted quickly for almost any kind of turning work. Tantalum carbide faces on the backrest act as a burnisher, eliminating rollers and misalignment due to roller wear and producing a highly polished surface.

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You can do it only with
**"Buffalo" UNIVERSAL
IRON WORKERS**

THIS is an exclusive feature available only in "Buffalo" Universal Iron Workers. Saves time, saves money, speeds production.

"Buffalo" Universal Iron Workers are available in a wide range of sizes, but whether large or small, each one offers the finest in design, ruggedness, and efficient operation. All frames are made of "Armor-Plate" electrically welded steel and are unconditionally guaranteed against breakage.

Send Coupon No. 8 for Bulletin 331.

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BUFFALO, N.Y.

IN CANADA: CANADIAN BLOWER & FORGE CO., LTD., KITCHENER, ONT.



PEDESTAL COMPARATOR



**INSPECTION
SPELLS
PERFECTION**

WHEN PARTS ARE
CHECKED ON A J&L
COMPARATOR



BENCH COMPARATOR

THE J&L Comparators meet the inspection requirements of tool room, laboratory, and production line.

They may be used to compare objects against a master outline, or to make direct measurements of height or depth and lead or spacing. They will measure angles within 5 minutes of arc.

The J&L Comparators are *the* machines on which to check each operation, on every part, so that your final product will bear an assured O. K. — let inspection spell perfection.

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JONES & LAMSON MACHINE COMPANY
SPRINGFIELD, VERMONT, U. S. A.

The Punch Press Sensation!

SUPER SPEED

No Vibration
INSTANT STOP
Quick Change

PUNCH PRESS

ACCURACY
Feed Control
While Punching

AN ENTIRELY NEW PRINCIPLE

1,000 BLANKS A MINUTE

—ONE DIE—

HOW?

By using the SUPER SPEED PUNCH PRESS with its continuous feeder which never allows the stock to stop.

No cams, pawls or ratchets.

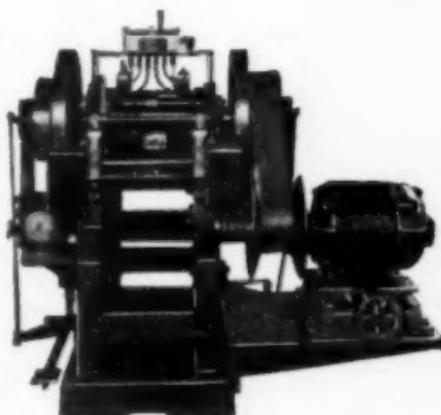
Greatest advance in speed since inception of punch presses.

Guides below punch level.

Variable speed control.

Operates with a single die. No costly "ganging" of dies.

High production means minimum labor cost.



Its production value has been fully proved.
Send samples of blanks for guaranteed production.

NOW BEING USED BY SOME OF THE LARGEST INDUSTRIAL COMPANIES!

Send Quickmail Coupon No. 50 for descriptive pamphlet.

SUPER SPEED PRESS CORPORATION

Plant:
Reading, Pa.

Office:- 55 Liberty St.,
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THE CLINCHOR

A MACHINE FOR AUTOMATICALLY
FEEDING AND SETTING CLINCH NUTS

- Set clinch nuts in a machine made for just that purpose.
- Set them easily and efficiently.
- Realize the savings that this method will make for you.

The nut is automatically placed in the anvil. The work is placed over the nut. A slight pressure on the foot treadle starts the machine operation to set the clinch nut and supply another nut to the anvil. May we send you a circular describing these machines?



Coupon No. 14 will bring full information.

THE TOMKINS-JOHNSON CO.
605 N. Mechanic Street Jackson, Michigan
European Office: GASTON E. MARBAIX, Ltd.
Vincent House, Vincent Square, London S.W.1, England

1905



1937

FLEXIBLE SHAFT MACHINES

We illustrate herewith our new style bench type machine for tool and die makers, with universal swiveling mounting. Also right angle hand piece.

TYPE MY4... $\frac{1}{4}$ H. P.



This machine is furnished in two combinations of speeds.

1700 — 3000 — 5200

or

3400 — 6000 — 10,400

RIGHT ANGLE HAND PIECE



Send for our Catalog—Sixty Types and Sizes

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N. A. STRAND & CO.

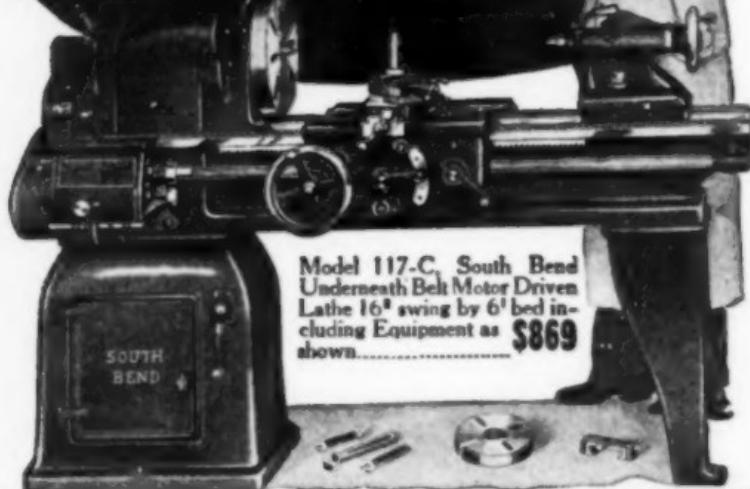
5001-5009 N. Wolcott Ave.,
Formerly Lincoln Street

CHICAGO

SOUTH BEND UNDERNEATH BELT

Motor Driven

LATHE



Model 117-C. South Bend
Underneath Belt Motor Driven
Lathe 16" swing by 6' bed in-
cluding Equipment as **\$869**
shown.

The New South Bend back-gearied screw cutting Lathes are used in leading manufacturing plants and machine shops for work requiring the highest accuracy and precision in production and tool work.

Write for general Catalog No. 96 giving details and full specifications. Sent Free Postpaid.

SOUTH BEND LATHE WORKS

190 E. Madison St., South Bend, Ind., U. S. A.

PRICES OF OTHER POPULAR SIZES



Size and Type Lathe	Between Centers	Ship'g Weight	Less C'shaft	Motor Drive
9 ¹ / ₂ x3 ¹ / ₂ Workshop Bench Lathe...	17 ¹ / ₂	320	\$ 85.00	\$116.00
9 ¹ / ₂ x3 ¹ / ₂ Junior Lathe.....	16 ³ / ₄	600	192.00	294.00
9 ¹ / ₂ x3 ¹ / ₂ Standard Change Gear....	16 ³ / ₄	655	257.00	359.00
9 ¹ / ₂ x3 ¹ / ₂ Quick Change Gear.....	16 ³ / ₄	655	297.00	399.00
11 ¹ / ₂ x4 ¹ / ₂ Standard Change Gear....	24 ¹ / ₂	920	339.00	487.00
11 ¹ / ₂ x5 ¹ / ₂ Quick Change Gear.....	36 ¹ / ₂	990	408.00	556.00
13 ¹ / ₂ x4 ¹ / ₂ Quick Change Gear.....	16 ¹ / ₂	1410	443.00	636.00
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SOUTH BEND Precision LATHES

Look For This Mark Before You Buy



Imperial Roller Bearing Punches

Offered in 3 sizes. Will work inside 90 degrees. Quick changing for punches and dies. No cams to wear. Stripping action is positive.



No. 16 Bench Punch

Capacity $\frac{1}{8}$ inch through $\frac{1}{4}$ inch iron. Depth of throat $3\frac{1}{2}$ inches. Height of throat $\frac{3}{8}$ inch. Length of handle 22 inches. Furnished with or without work table and equipped with 3 punches and dies in $\frac{1}{8}$, $\frac{3}{16}$, and $\frac{1}{4}$ inch size unless otherwise specified. Same style made in $6\frac{1}{4}$ inch size throat depth.



Send Coupon No. 42
for the complete
Whitney catalog

Made by the World's Largest Manufacturers
of Punches and Shears.

Whitney Metal Tool Co.
ROCKFORD, ILLINOIS

SAVE **TIME**
and **TROUBLE** !

**GET
ACTION**

**on your requests for
catalogs and detailed
information.**

**Use the Quickmail Coupons
provided for your conven-
ience in every issue of The
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When you see a machine in The Blue Book on which you'd like information, GET ACTION ON YOUR INQUIRY BY QUICK-MAIL—giving the manufacturer your name, the firm for which you work and your position, preferably on your letterhead.

The handy Quickmail Coupon is a mailing label addressed to the manufacturer. The specific information which the Coupon will bring you is stated on the reverse side. It is gummed like a postage stamp. Use the Quickmail Coupons for Speedy Action, But . . .

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THEN MAIL—It's as
simple as 1-2-3.

AND FIRM —



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HIGH SPEED

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TAPPING ATTACHMENTS

WITH THE NEW

"TRU-GRIP" TAP HOLDER



The most sensible tap holder that ever gripped a tap.

ONLY Procurier tappers have the Patented Three-Point Balanced heat treated Gear Reversing Mechanism. This special feature distributes the pull among three gears instead of one, reducing strain and wear to the minimum and giving longer life.

ONLY Procurier tappers have the new "Tru-Grip" Tap Holder.

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14 S. Clinton St., Chicago, Ill.

OUR BEST PAYING INVESTMENT

Up to \$2,295 Yearly Savings
in production costs, reported
by plant executives through
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STERLING Speed-Bloc Sander (Air Driven)



Weight 5½ pounds

The Sterling by its oscillating action is filling a decided need in industry, substantially cutting labor costs, increasing production schedules and enabling workmen to turn out a better finished product, without ridges, ripples or chasing. Replaces hand sanding and rubbing on wood, metal, fabric, leather, castings, stampings and composition surfaces. Designed for WET and dry work on CURVED and flat surfaces.

*Investigate this modern, proved device.
Send Coupon No. 66 today for literature.*

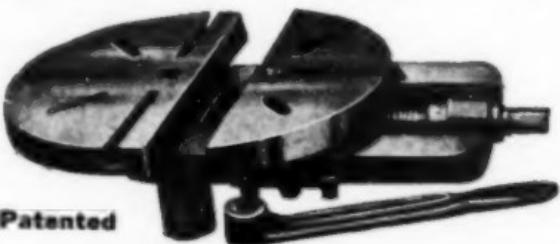
STERLING PRODUCTS COMPANY

383H DONOVAN BUILDING.

DETROIT, MICHIGAN

FREE TRIAL OFFER

Combination Drill Table and Vise



Patented

**GUARANTEED To Save Its Cost in
Labor Every Six Months**

To save time with quicker and more accurate set-ups in your shop, install a Modern "Combination." It's safer and easier to use, handles difficult jobs without blocks, clamps or awkward plates and helps to prevent accidents by eliminating dangerous holding by hand. Manufactured in models to fit every drill press. Write today for complete information on the "Combination" and our 30-day trial, giving dimensions of the table you wish to replace.



30-DAY FREE TRIAL

Costs you nothing. If you are not satisfied in 30 days, we will pay the freight both ways.

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MODERN MACHINE TOOL CO.
JACKSON, - - - MICHIGAN

Manufacturers of the "Modern" Cutting-Off Machine

"Give Me End Mills



with the

PUTNAM

'Hi-Speed'
Trademark"

"Putnam Hi-Speed"
is Stamped In the
Metal of Every
Putnam Tool. Look
For It!



You don't need an X-Ray eye or an uncanny sense of judgment to select perfect end mills on sight alone. The "PUTNAM HI-SPEED" trademark on any end mill is positive assurance of fast, accurate cutting performance and long, trouble-free life. One trial will convince you that PUTNAM END MILLS will meet your most exacting requirements and also effect real production savings.

Send Quickmail Coupon No. 67 for complete catalog of our full line of end mills, end mill holders, reamers, counterbores and special tools. It's your guide to precision tools that cut faster and last longer.

PUTNAM TOOL CO.

2983 CHARLEVOIX AVE.

DETROIT, MICH.

LOWER COST and FINER WORK

Through the Use of These Tools Designed For Precision Work on B. & S. Automatic Screw Machines



Banner Swing Tools

Entirely free from "end play" due to the fact that they are designed with a large head on the fulcrum screw. Head of tool moves between two flat surfaces instead of on a shaft. Oil hole is provided for lubricating the head. For straight or taper turning these tools are without an equal, as they are extremely accurate and provide a fine finish. When used as cut-off tools produce superior results by reducing the amount of burr. Exceptionally rigid, they assure longer life of tool bits and permit a heavier feed than is usual.

All sizes carried in stock for immediate shipment.



Banner Recessing Swing Tools

For precision work and internal forming Banner Recessing Swing Tools are superior, embodying the same features as Banner Swing Tool design. Constructed so that chattering is entirely eliminated. Absolute rigidity assures accurate, maximum production. Tool bits have longer life and will not snap off.



Tool Bits for Swing Tools

Made for use in conjunction with Banner Swing Tools, but will also fit B. & S. Holders. Manufactured from high speed steel, tool hardened. Two distinct types, ground to meet your particular requirements.

**Full Information Given in Banner Catalog
Use Quickmail Coupon No. 69**

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NOPAK

3 and 4-Way Operating Valves

FOR AIR, WATER AND OIL



FOR OIL OR WATER



FOR AIR

Sturdy yet simple in construction, NOPAK Operating Valves offer long, efficient operation without maintenance cost, and with absolute freedom from leakage.

The NOPAK flat disc design provides advantageous port spacing, which insures positive, accurate control with both throttling or quick opening action, as desired.

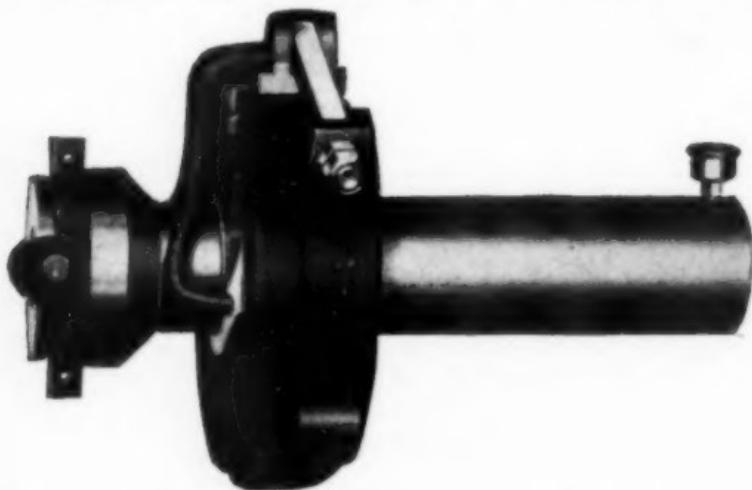
- * No Packing
- * No Maintenance
- * Leakproof
- * Protected Disc and Seat
- * Quick or throttling action, desired

WRITE for Bulletin

Use Quickmail
Coupon No. 20

GALLAND-HENNING
MANUFACTURING COMPANY
2753 South 31st Street Milwaukee, Wisconsin

CONWAY PATENTED COMPRESSION CLUTCH



Strong—Simple—Efficient

Simple, easy mounting; adjustment merely taking up on a nut; friction band wraps in complete peripheral contact about the drum, and when Clutch is released the band springs back into a machined guide which holds it concentric with the bore providing clearance between the friction surfaces when the Clutch is idle; engagement so easy it could be operated with the thumb; drag-free idling, instant release.

These efficiency operating features, plus husky construction and interchangeable parts, make for completely satisfactory Clutch service.

Send for details—ask Conway engineers for special data to help you find the right Clutch. Have you Bulletin No. 36?

PATENTED IN U. S. A. AND CANADA

THE CONWAY CLUTCH CO.

Also manufacturers of the splendid Conway Disc Clutch

1541 Queen City Ave., Cincinnati, Ohio

Siewek Rapid Clamping **Drill Jigs**

A TYPE FOR EVERY JOB!



Stick coupon No. 37 to your firm letterhead and sign your name and title for catalog showing the complete Siewek line of rapid clamping drill jigs.

SIEWEK TOOL CO., FERNDALE,
MICHIGAN

NEW METHOD FOR REMOVING BROKEN BOLT ENDS FROM DEPTHS

without dismantling or
expensive delays

Three easy steps with **RIDgid**
"LonGrip" and your broken
threaded ends are OUT!

FIRST — Drill a small hole clear
through the broken end using a snug
fitting **RIDgid** Drill Guide for
precision centering. This centering
hole is for the larger drill to follow.

SECOND — Remove Drill Guide.
Drill out the small center hole to
large diameter for receiving the
husky "LonGrip" straight fluted
extractor.

THIRD—Drive the "LonGrip" ex-
tractor into the thin hollow remain-
ing shell and turn it out. No slip-
ping, no reaming. Does not expand
or distort sidewalls of shell no matter
how thin or how far the tool is
driven in.

Sets for all sizes of studs and
screws and various depths.

ASK YOUR JOBBER TO SHOW YOU THESE
REMARKABLE TROUBLE-SHOOTING TOOLS

RIDgid
LONGRIP
STRAIGHT-FLUTED SCREW AND PIPE
EXTRACTORS

THE RIDGE TOOL CO., ELYRIA, OHIO

**"WE'RE SAVING
\$100 TO \$300
MONTHLY WITH
OUR NEW**

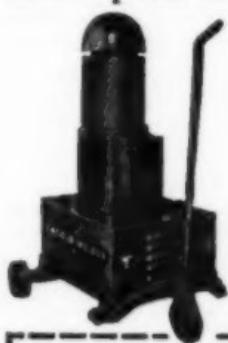


LINCOLN WELDER"

"This new Lincoln welds anything that comes into our shop—tool steel, cast iron, aluminum—light and heavy parts of all kinds. We now do our own fabrication and welding repair work, saving several hundred dollars every month. Honestly, this little Lincoln welder is the most valuable machine in our shop," says the foreman of a moderately sized machine shop in Toledo, Ohio.

Electric power for welding with this Lincoln welder usually

costs as little as 5c per hour. It welds 2 to 3 times faster and easier than other welding processes. You can pay for this high-grade arc welder out of a few months' savings. Easy installments can be arranged. Mail the coupon.



**FOR LIGHT AND HEAVY MACHINE
SHOP WELDING THE LINCOLN "SA-150"
Range 45-150 amps. with Plus-Zone Range.**

THE LINCOLN ELECTRIC CO., Dept. AD-408, Cleveland, Ohio

Send a free copy of Bul. 314 and details on the Lincoln "SA-150" Welder.

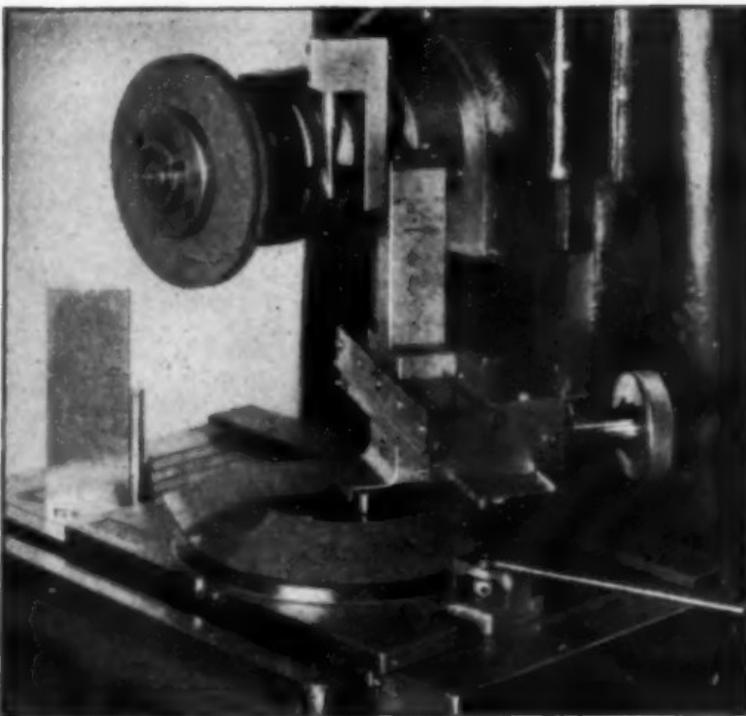
Name _____

Company _____

Address _____

The Vinco Angle Tangent to Radius Dresser for Internal, External and Surface Grinding Machines

Patented June 5 1934, other patents pending



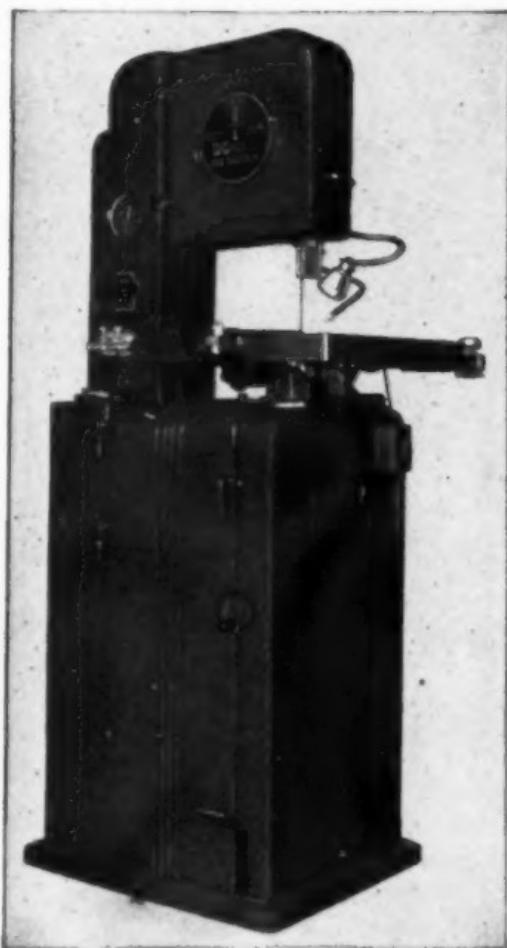
ACCURACY AND ECONOMY

The Vinco Dresser was designed for the accurate and economical dressing of angles and radii tangent on abrasive wheels. It functions perfectly for it has the basic patented feature of dressing angles and radii from the same axis without moving the diamond, angles and radii are always tangent. Angles are accurate for the Index Plate and Vernier are graduated on a Vinco Master Dividing Head to a one ten thousands of an inch accuracy. It has adjustable stops, the index plate can be set at any desired angle. The cut above shows the Dresser fitted with a Vinco Special Attachment that permits the dressing of complete half circles from .050 to .565 radii. The Dresser fitted with the regular diamond will dress all angles and radii tangent. The Vinco Dresser is precision made, all parts subject to wear are hardened, ground and lapped. It is guaranteed to be satisfactory.

Send Coupon No. 48 for Descriptive Circular

VINCO TOOL COMPANY
7348 CENTRAL AVE., DETROIT, MICHIGAN

METAL MASTER



DOALL CONTOUR SAWING has an even wider application with this improved combination tool room machine.

Use Quickmail Coupon No. 65 on business letterhead for full information and demonstration.



CONTINENTAL MACHINE SPECIALTIES
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**From the smallest standard
to the largest special**

DIAMOND-GRIP COLLETS

grip tighter under less tension

● Advantages of DIAMOND-GRIP SERRATIONS are delivered by all sizes and styles of Sutton Collets. If your job requires special collets, send work and machine specifications. A quotation and layout of DIAMOND-GRIP COLLETS specially engineered to your job will be submitted promptly.

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SUTTON TOOL CO., 2836 W. Grand Boulevard,
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END MILLS for All Purposes

SHEAR CUT END MILLS

YOU will find an end mill for practically every job in the standard line of Progressive Shear Cut End Mills. They will give accurate, economical service due to the careful, constant attention given to the workmanship and material used in their manufacture.



SEND us
your blue prints
on special end mills.

Our many years of experience in the design and manufacture of standard Progressive products is always at your disposal without any obligation on your part. We guarantee that only the best of materials are used and the finest workmanship. We can quote very attractive prices and assure prompt delivery.

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PROGRESSIVE TOOL & CUTTER CO.
FERNDALE, MICHIGAN

SPEED UP
NUT TURNING
WITH THE
FAVORITE
REVERSIBLE RATCHET
WRENCH

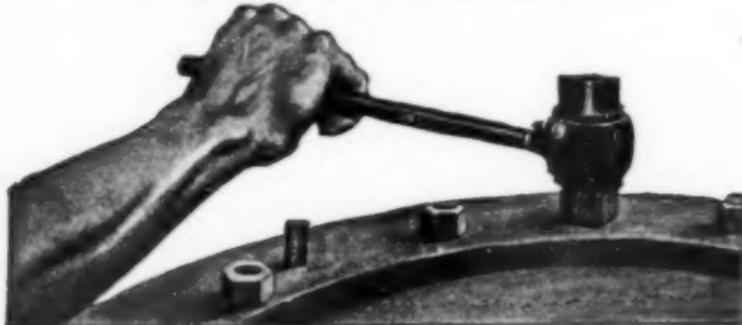
Try the "FAVORITE" on a nut that has been tightened by an ordinary wrench and see how many more turns you can take up on it before it is securely seated.

The "FAVORITE" is a time-saver, with its straight-ahead ratchet motion. By throwing pawl, reverse action is instantaneous.

The "FAVORITE" turns two different-sized nuts in each head—one on each end. A distinct saving in number of parts to hold in stock.

Opening clear through head for a free passage of bolt.

Send Quickmail Coupon No. 35 for full particulars.



GREENE, TWEED & CO.
109 Duane St., New York, N. Y.
SOLE MANUFACTURERS

HANDY

*As His
Steel Scale*



The mechanic with a Stanley Flexible Shaft Grinder in his tool kit is ready to tackle scores of jobs. Burr off rough castings or put "finishing touches" on a die; nose into close quarters or grind away at a big job. This tool has ample power to drive a $1\frac{1}{2}$ " wheel on a tough surface.

- ★ $\frac{3}{8}$ h.p. Universal Motor,
18,000 r.p.m.
- ★ 42" Rubber Reinforced
Flexible Shaft
- ★ Precision Ball Bearings in
Handle Piece
- ★ Combination Bench and
Overhead Holder

The specifications will tell you why this tool will deliver full production service. Ask your Stanley distributor for a free demonstration, or write for Catalog 64M. Stanley Electric Tool Division, The Stanley Works, New Britain, Conn.

STANLEY

A Complete Line For Industry



**ELECTRIC
TOOLS**

"Cost Less Per Year"

"HALLOWELL" STEEL TOOL STANDS

These stands go right to the scene of the job . . . keep tools safe and in order, eliminate the confusion of the old-fashioned, traveling tool box. Time savers, money savers—they have a definite place in your shop.

Fig. 705—"Hallowell"
Steel Tool Stand. With
or without casters. Very
handy around machine
shops, service stations,
garages, etc.

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SAN FRANCISCO

Send me your catalog showing "Hallowell" Steel Tool Stands and other Factory Furniture.

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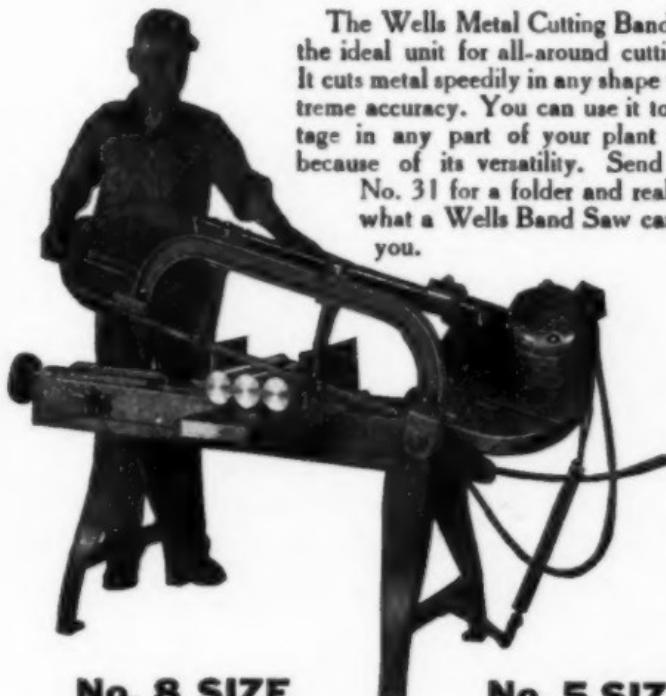
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Band Saw Efficiency at its peak — It's a WELLS!

The Wells Metal Cutting Band Saw is the ideal unit for all-around cutting jobs. It cuts metal speedily in any shape with extreme accuracy. You can use it to advantage in any part of your plant or shop because of its versatility. Send coupon

No. 31 for a folder and really learn what a Wells Band Saw can do for you.



No. 8 SIZE

8 in. diameter round
or 8 in. by 16 in. flat.

No. 5 SIZE

5 in. diameter round
or 5 in. by 10 in. flat.

WELLS MFG. CORP. Three Rivers,
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DEPENDABILITY
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QUICK DELIVERY

*Write for a set of
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use Quickmail Coupon No. 55.*

Consider Results— when you buy Equipment—

Milling Machines

Grinding Machines

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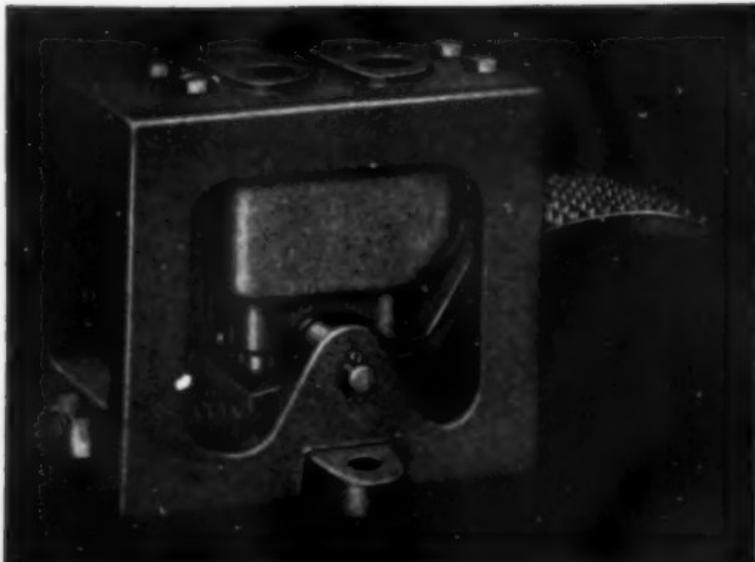
Pumps

Misc. Shop Equip.



Have you our general catalog
No. 140? A copy gladly
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R. I., U. S. A.

BROWN & SHARPE



ROSS Operating Valves

MODEL ST

Four-Way, Foot Controlled, Non-Locking Type
for the control of single and double acting cylinders

Made also in hand, mechanical and solenoid controlled types. All parts interchangeable between different models in like sizes—that means small inventory of spare parts.

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Ross Operating Valve Company
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HI-DUTY PNEUMATIC MARKING MACHINE

This is a light, general purpose hand marking machine for use on flats, rounds and irregular surfaces, which is supplemented with an air cylinder to take the place of the foot pedal for applying pressure to raise the work table to the lettering tool. Air from the shop line is used and the four way foot valve assures fast operation. Machine uses solid flat or round dies, as well as adjustable type, in flat or knurl type holder.



Advanced business methods demand improved records of metal fabrications and this machine makes marking operations quick and simple. Part numbers — order numbers — manufacturer's name and other important data marked on your products will mean permanent records, to last the life of the part. This general purpose marking machine will help you.

**Send Coupon No. 70 for complete catalog of our full line
of Marking Tools, Machinery and Equipment.**

Designed and Built By

GEO. T. SCHMIDT, INC.,

1802 Belle Plaine Avenue,

Chicago, Illinois.

Builders of Marking Equipment since 1895.

ADJUSTABLE
While Running!



NEW
Absolutely Different

THE PRECISION UNIVERSAL TOOL HEAD

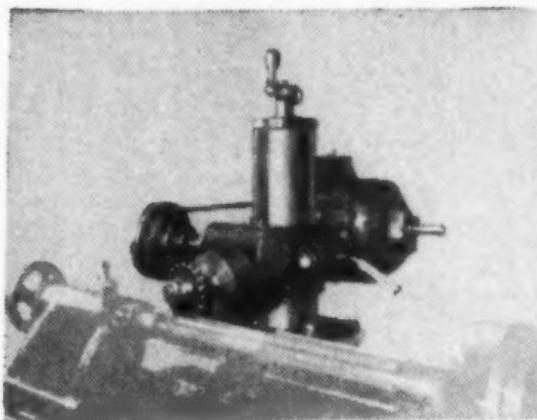
does not need an introduction! It has proved itself to have **SPEED, RANGE, EFFICIENCY** and **ADJUSTABILITY**, at all times and at all speeds, **WITHOUT STOPPING EITHER TOOL OR MACHINE!**

ONE COMPACT SIZE handles all diameters, internal or external from $1/16$ to $16"$. For Boring, Facing, Recessing, Trepanning, Undercutting, etc.

Bulletins sent on request. When you write,
use Quickmail Coupon No. 60.

THE PRECISION TOOL COMPANY
Bridgeport, Connecticut

★ IT'S AMAZING !!! The MASTER Lathe Converter ★



Easily and quickly attached to an ordinary engine lathe.

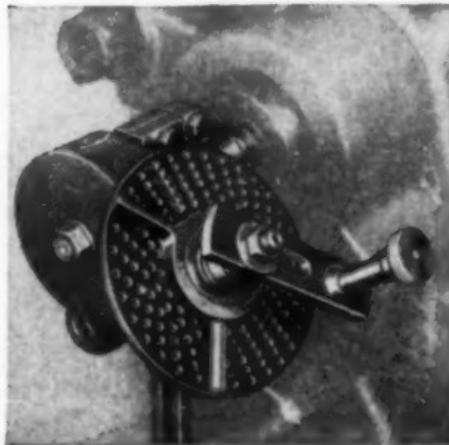


Does all milling operations such as: gear work, spline work, broaching keyways, hobbing etc. Grinding at all angles, internal or external.

**No Dismantling of Lathe — Fits on compound same as your tool post.
Not "Just Another Lathe Attachment"**

USE QUICKMAIL COUPON NO. 44

The MASTER Geared Type Dividing Head ★



Fits into rear open end of lathe spindle. Has 40 to 1 reducing gear—counting indicators, three plates allowing 720 divisions. Collet furnished to fit your spindle.

**MASTER MACHINE & TOOL CO.
NORTH KANSAS CITY, MISSOURI**



● Originally developed for a large car manufacturer, the same application is now available to general industry. It sorts, feeds, inserts and sets 4 rivets with a single pedal operation. **STILL LOWER ASSEMBLY COSTS ARE NOW PRACTICAL.** Tell us your problems and send sample assembly with inquiry, if possible.
Single, Double, Triple and Quadruple Rivet Setters for Tubular and Split Rivets

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RIVET & MACHINE CO.
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TUBULAR AND SPLIT RIVETS—ALL METALS

Use QUICKMAIL COUPON NO. 56

It will bring you our rivet price list and illustrations of Chicago Automatic Rivet Setters. On specific production problems write letter and send sample assembly or blue print.

HITCHCOCK'S
Machine Tool
BLUE BOOK

Selected
Circulation

25,000
Monthly

JULY, 1937

THIRTY-SECOND YEAR

**Prospects for Summer Business
Better Than Usual**

The outlook for machine tool manufacturers continues to look good for this summer. Although the index of machine tool orders for the month of May declined to 208, it returned only to the March level, leaving the average of incoming business for the first five months of the year still 86% ahead of the same period for 1936.

Strikes and sit-downs have aided rather than hindered most machine manufacturers, since industries whose production has been delayed by labor troubles are now relying on the purchase of modern, high speed equipment to make up for the lost time and to compensate for higher labor costs.

Published By

Hitchcock Publishing Co.
508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

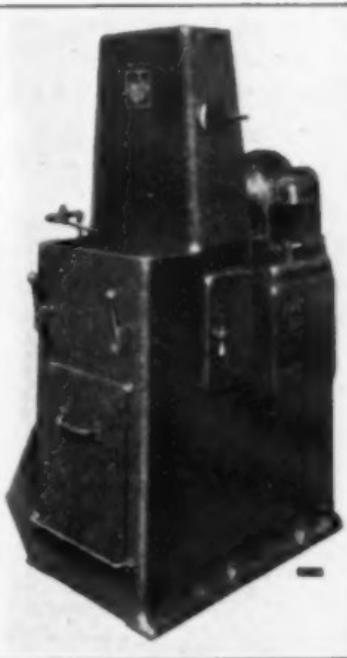
New Type PD (Pull Down) American Broaching Machine

The American Broach & Machine Co., Ann Arbor, Mich., Division of Sundstrand Machine Tool Co., Rockford, Ill., announce a new broaching machine which is shown in the accompanying illustration. An illustrated leaflet, which the manufacturer will gladly send to any one interested, sets forth the advantageous features of the new machine.

Briefly; the heavy, compact base and column provides rigid support for work and machine elements and encloses the operating mechanism. The pulling ram is integral with the hydraulic cylinder and slide-ways, equipped with American automatic broach puller. The slide-ways have long bearings on hardened and ground steel, which entirely surrounds them throughout their entire travel, making for long life and retention of accuracy.

Completely submerged in oil in a separate compartment of the base, the Sundstrand hydraulic unit supplies uniform oil flow at correct pressures and in suitable volume for the smooth, powerful cutting stroke and rapid return. The hydraulic circuit includes an adjustable safety valve and is precisely controlled by a specially designed four-way valve.

In operation, the work-piece is placed on the pressure plate, and the broach is passed through the work into the pulling head. The operator must place his right hand on the operating lever and left hand on the safety lever simultaneously to cause any movement of the broach. When the part is broached, the operator re-



(Continued on Page 48)

DO IT—

Better—Faster—for Less!

with ODIN UNIVERSAL

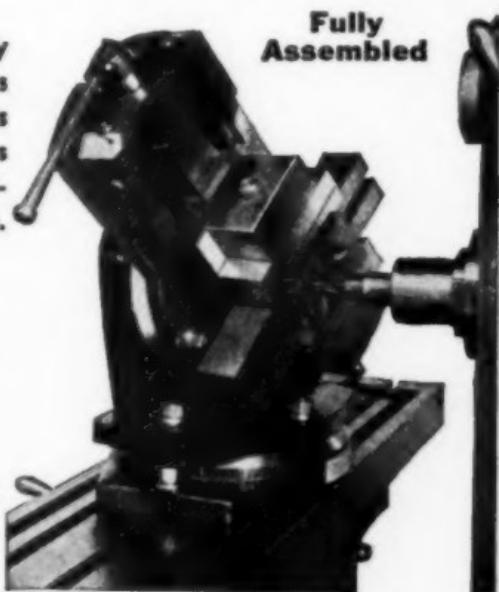
**Precision Vises
Swivel and Plain**

**with Interchangeable Jaws and
Hardened and Ground Parallels**

They quickly pay
their costs in savings
on High Tool Costs
—Expensive Fixtures
—Patterns and cast-
ings—Extra Set-Ups.

**Investigate the
money saving
possibilities of
ODIN VISES**

**Send Quickmail Coupon
No. 71 for full facts
and prices.**



**Let us show you how to make cheaper and
better jigs and fixtures at a greatly reduced
cost—with a great saving in time.**

ODIN UNIVERSAL
CORPORATION

CHICAGO

**Sales Division
110 S. Dearborn St.,**

**Telephone
Franklin 3281**

moves it, returns ram to the starting position, lifts out the broach and is ready for the next cycle. The machine is readily changed from one type of job to another by substituting suitable broach-guides and broaches. Adjustment of stroke-length is made easily upon opening door at side of column. Pressure in the hydraulic circuit may be observed at any time by opening the shut-off cock which protects the fan-type gauge. A spout at the lower left-hand side of the machine facilitates chip removal.

A standard 5 h.p., 1800 r.p.m., motor drives the machine through multiple Vee belts direct to the shaft of the Hydraulic Unit. Motor is mounted away from dirt and chips, and a substantial guard encloses the drive to the hydraulic unit and coolant pump.

Quickmail coupon No. 64 fixed to your business letter head will bring an illustrated bulletin giving a further description of this machine.

Wells Produces a New Upright Saw

The Wells Mfg. Corp., of Three Rivers, Mich., have developed a new upright saw designated as No. 7-B, particularly adapted for foundry work.

With nine speeds ranging from 60 to 1400 ft. per minute, the new saw is so flexible that it lends itself to a wide range of work. Throat clearance is 14 inches vertically and 14½ inches horizontally. The table is arranged to tilt 45 degrees right, and 10 degrees left.



The saw may be used in a rigid upright position for sheet metal, pattern work, sawing sprues off castings, etc. The upright saw frame is hinged at the bottom and may be released and fed into the stock automatically. Stock is clamped on the table with a vise which is provided, or by using the T-slots and clamps a greater variety of work may be done.

(Continued on Page 50)

New! SKILSAW DISC SANDER

TWO POWERFUL MODELS FOR
HEAVY DUTY AND CONSTANT
PRODUCTION SERVICE



SKILSAW

These two 2 hp. SKILSAW Disc Sanders incorporate everything that is new in fine portable tool construction. Compact streamlined design, greatest power, most engineering refinements. Compare every feature and you will choose one of these tools for all sanding and grinding now done by costly hand methods. Get them at your distributor's! Send Coupon No. 16 for catalog.

SKILSAW, INC.

2028 FILSTON AVE.
12 EAST 42nd Street, New York — 12 South Ave., Bridge

CHICAGO

112 Longfellow, Paterson
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Here are the features

SKILSAW DISC SANDERS

STREAMLINED BODY — Smooth trim design, perfect balance and light weight make them easier to use. Comfortable handles give complete control under heavy sanding loads.

STRAIGHT-LINE VENTILATION — As a cool-running tool, they are located to blow away from operator and prevent clogging. Efficient air-filter protects condenser and motor from abrasive dust and dirt.

POWERFUL MOTOR — Ample reserve power to insure long life. Provides for fast sanding and grinding.

SEALED BEARINGS — bearings, in all positions, fully sealed as a protection against dust and grease leakage.

BEVEL GEARING — Strong and quiet in operation.

moves it, returns ram to the starting position, lifts out the broach and is ready for the next cycle. The machine is readily changed from one type of job to another by substituting suitable broach-guides and broaches. Adjustment of stroke-length is made easily upon opening door at side of column. Pressure in the hydraulic circuit may be observed at any time by opening the shut-off cock which protects the fan-type gauge. A spout at the lower left-hand side of the machine facilitates chip removal.

A standard 5 h.p., 1800 r.p.m., motor drives the machine through multiple Vee belts direct to the shaft of the Hydraulic Unit. Motor is mounted away from dirt and chips, and a substantial guard encloses the drive to the hydraulic unit and coolant pump.

Quickmail coupon No. 64 fixed to your business letter head will bring an illustrated bulletin giving a further description of this machine.

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The saw may be used in a rigid upright position for sheet metal, pattern work, sawing sprues off castings, etc. The upright saw frame is hinged at the bottom and may be released and fed into the stock automatically. Stock is clamped on the table with a vise which is provided, or by using the T-slots and clamps a greater variety of work may be done.

(Continued on Page 50)

New! SKILSAW DISC SANDER

TWO POWERFUL MODELS FOR
HEAVY DUTY AND CONSTANT
PRODUCTION SERVICE



SKILSAW

These two 7 in. SKILSAW Disc Sanders incorporate everything that is new in fine portable tool construction. Compact streamlined design, greater power, more engineering refinements. Compare every feature and you will choose one of these tools for all sanding and grinding now done by costly hand methods. See them at your distributor's! Send Coupon No. 16 for catalog.

SKILSAW, INC.

3318 KELSTON AVE., CHICAGO
210 East 4th Street, New York — 62 Brooklyn Ave., Boston
1629 Spring Garden, Philadelphia
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Here are the features

SKILSAW DISC SANDERS

STREAMLINED BODY — Smooth trim design, perfect balance and light weight make the easier to use. Comfortable handles give complete control under heavy sanding loads.

STRAIGHT-LINE VENTILATION — Assures a cool-running tool. Holes are located to blow away from operator and prevent clogging. Efficient air-filter protects condenser and motor from massive dust and dirt.

POWERFUL MOTOR — Ample reserve power to insure long life. Provides for fast sanding and grinding.

SEALED BEARINGS — bearings, in all positions, fully sealed as a protection against dust and grease leak.

BEVEL GEARING — Strong and quiet in operation.

The upright frame swings down to the floor where gates and risers may be cut off large castings that are too heavy to place on the table. The capacity at this point is 14x18 inches. Bar stock up to 6 inches may also be cut at this position.

This versatile saw was built for use in pattern shops, sheet metal works, cutting gates and risers in foundries, for cutting any shape of structural steel, bar stock, maintenance work, tubes, pipes, etc. They'll be glad to send a descriptive leaflet to all who are interested.

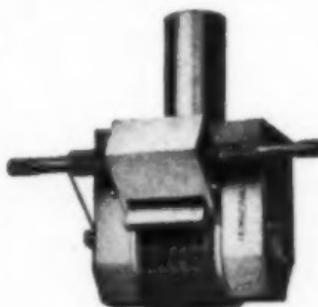
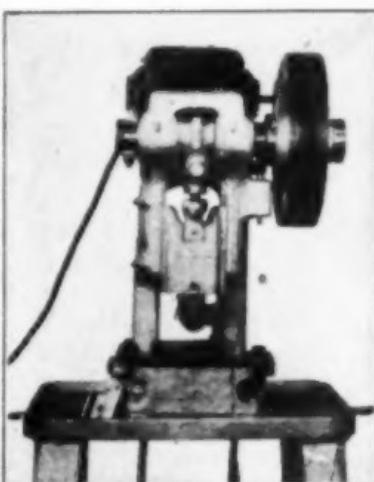
Automatic Wire Numbering Machine

Numberall Stamp & Tool Co., Huguenot Park, Staten Island, N. Y., have developed a power press with automatic numbering head for use by wire mills and screw manufacturers in marking pieces of test wires.

The press is driven by a $\frac{1}{4}$ h.p. motor and has an automatic numbering head which stamps consecutively, $\frac{1}{16}$ inch figures in a vertical position on wires. For the most part, three or four wheels are used which stamp figures up to 999 or 9999 respectively. Bolster with V blocks are designed to take wires from $\frac{1}{16}$ to $\frac{1}{2}$ inch in diameter.

The numbering head can also be furnished to duplicate or triplicate the numbers stamped, and the marking operation can be done very rapidly with this press, which is shown in the accompanying illustration. A close-up view of the numbering head reveals some details of its construction.

The manufacturers will gladly supply full information on request.



ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

Lost Machine Hours

Lost Profits



The smooth operation of a plant is dependent on the operation of its Tool Room. Without Tools quickly adaptable to every need, without tools that will "stand the gaff"—valuable Machine Hours are lost—carries right through the plant with retarded production and resultant departmental jam-up . . . means only one thing *Lost Profits* at each step.

With the ARMSTRONG System of Tool Holders there's a tool for every job—a tool that Saves All Forging 70% Grinding and 90% High Speed Steel and each tool built to "stand the gaff". Over 100 sizes and shapes for every operation on lathes, planers, slotters and shapers and for standard operations on Turret Lathes and Screw Machines.

End lost Machine Hours—Lost Profits by starting today to build your Armstrong System—no costly change-over or confusion—add each new ARMSTRONG TOOL HOLDER only as needed. ARMSTRONG TOOL HOLDERS are stocked by leading Mill Supply Houses. They are as available as your telephone. *Send Quickmail Coupon No. 6 for a complete catalog.*



Armstrong Bros. Tool Co.
"The Tool Holder People"
308 N. Francisco Ave., Chicago, U.S.A.

Cincinnati Presents New Wet Abrasive Cut-Off Machine

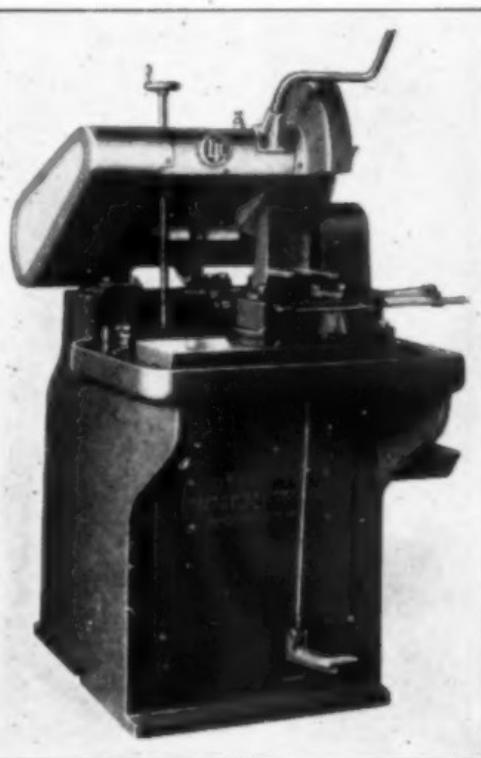
The Cincinnati Electrical Tool Co., Cincinnati, Ohio, offer a new wet abrasive cut-off machine for straight or angle cutting of practically all materials encountered in general manufacturing, including steel alloys, non-ferrous metals such as brass, copper, aluminum and also fibrous and plastic materials in various sizes, angles and shapes.

The wet cutting feature is said to add materially to the life of abrasive cut-off wheels and also to produce cuts with a minimum of burr. Burning is overcome by directing the coolant on the point of contact in the cut and on the sides of the wheel as well.

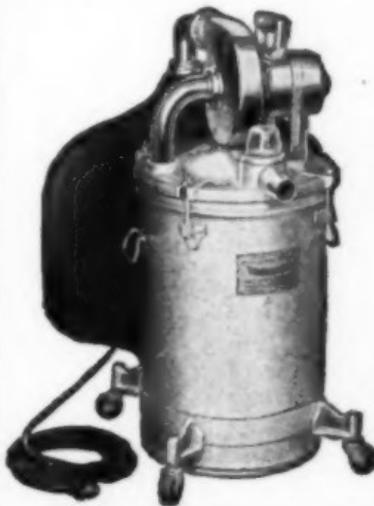
The machine shown in accompanying illustration is intended for straight or angle cuts in solids up to $2\frac{1}{4}$ inches or tubing up to $3\frac{1}{2}$ inches in diameter, the same vise being suitable for the various cuts. For angles up to 45 degrees the maximum capacity is $2\frac{1}{4}$ inches. Graduations on the table make angle cutting fast and accurate.

Material is held in the vise by spring tension on the jaws and work is released by foot lever after the cut is completed, so the operator's hands are free at all times. Work is held securely on both sides of the

(Continued on Page 54)



*For the First Time! Vacuum Cleaning
Made Applicable to All Plant Cleaning
Requirements at Low Cost With*



Breuer's Ball Bearing
TORNADO
Portable Industrial
Vacuum Cleaner

This new machine is designed to solve all industrial cleaning problems without the expense of installing a stationary plant or using so-called portable cleaners which are too heavy and expensive for average plant applications.

TREMENDOUS POWER
1 H. P. Motor—46 $\frac{1}{4}$ Waterlift

Do not confuse the TORNADO with light-duty cleaning machines. Model 112 combines light weight (only 40 pounds) with tremendous cleaning power (1 H. P. G. E. ball bearing Motor Motor—46 $\frac{1}{4}$ waterlift). Patented principle of separating fine dust from refuse and depositing heavy dirt in tank makes this cleaner as applicable to heavy duty work as the largest machines. Sturdy construction insures long life and low yearly cost.

Has plenty of power and capacity to handle dust, dirt, sand, sawdust, metal scraps, filings, etc. Attachments available for cleaning boiler tubes, ovens, machinery, walls, floors, pipes, etc. Motor unit can be quickly removed for blowing dust from motors, etc. The handiest heavy duty, low cost, time and labor saving unit ever built.

We prove TORNADO advantages right in your plant without obligation. Send Quickmail Coupon No. 30 for details of trial offer and further information or write.

BREUER ELECTRIC MFG. CO.
842 Blackhawk Street,
Chicago, Illinois

cut, preventing cramping of the work and wheel breakage. The abrasive wheel is moved into the work by means of a hand lever, and the arm which carries the abrasive wheel pivots on the pedestal with a counterbalance for easy operation. The wheel is guarded except for the actual cutting section.

A stop is provided which may be set for any depth of cut within the capacity of the machine, and a longitudinal stop is provided for regulating the length of material to be cut.

Two sets of wheel flanges in different sizes are furnished to insure maximum use of the abrasive wheels, and a shaft locking device facilitates wheel changing.

The coolant system comprises a $\frac{1}{4}$ h.p. direct motor driven centrifugal pump with 10 gallon tank, piping and convenient control valve.

The spindle is of nickel, mounted on sealed-type deep-grooved ball bearings running in oil. Labyrinth seals prevent the ingress of grit or dirt into the bearing housings, and a convenient drain plug provides for oil renewal.

The spindle is driven by multiple V-belts from a $7\frac{1}{2}$ h.p. ball bearing drip-proof motor operating at 1800 r.p.m. Motor is mounted in the pedestal with magnetic starter, overload and no-voltage protection, and push button control. It can also be equipped with 10 or 15 h.p. motor if desired.

Full particulars may be obtained by addressing the manufacturers. Use Quickmail coupon No. 21 on your business letterhead when you write for details.

Rockford Announces Two New Hy-Draulic Shapers and a Double-Housing Hy-Draulic Planer

The Rockford Machine Tool Co., Rockford, Ill., announce a trio of interesting new Hy-Draulic machines—a double-housing planer, a 36" openside shaper and a 12" high speed shaper. These new products are illustrated and fully described in attractive leaflets which the manufacturer will be glad to mail on request to any interested readers.

The planer is equipped with a standard constant speed motor for driving the hydraulic unit, which it is pointed out, supplants the usual reversing motor and

(Continued on Page 56)

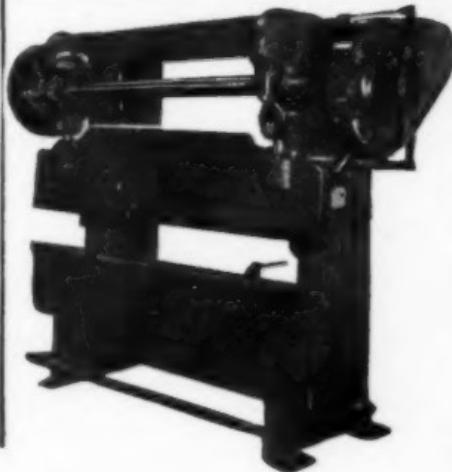
**CAPACITY to BEND
96" of 10 GAUGE**

Verson

**ALLSTEEL JR.
PRESS BRAKES
LEAD THE
FIELD**

**the NEW
BIGGER
IMPROVED**

**Investigate
These
Cost
Reducers
Now!**



Complete information on request.

THE ALLSTEEL PRESS CO.
12017 So. Peoria St., CHICAGO, ILL.

its complications. Many detailed advantages of the hydraulic drive are enumerated, the basic ones being increased production, cutting of costs, improved quality of work, removing more metal per horsepower and providing a finer finish.

The new planer has many new construction features and refinements that should appeal to the man who uses a machine of this type.

The 36" Hy-Draulic openside shaper is said to overcome the deflection difficulties sometimes encountered with ram-type shapers, by reciprocating the work instead of the tool, providing a double-length bed and planer-type table which supports the work solidly at all points in its travel. The cutting tool head is carried on an easily adjusted heavy rail. This construction is offered as retaining the speed and convenience of the shaper with the accuracy and easy set-up of the planer, and the openside design extends the field of application.

The manufacturer offers the new 12" shaper with the conviction that it represents a decided advance in shaper design, construction and operation and that it offers the user greater proportionate benefits than he receives from the use of hydraulic power in other machine tools. Detailed comparisons of the advantages of hydraulic and mechanical drives are given, which in this instance are free from bias because this particular manufacturer produces both types.

The new 12" Hy-Draulic Shaper has many very attractive features, developed as a result of long experience in shaper production, and the new model evidently is a substantial contribution in the direction of increased production and reduced operating costs.

Executives interested in any of these machines may use Quickmail coupon No. 40 when writing for information.

New Booklet on Pullmore Clutches

Rockford Drilling Machine Division of Borg-Warner Corporation, 113 Catherine St., Rockford, Ill., have issued a new booklet on Pullmore clutches illustrating a number of machines of varying types and applications, with exact locations of the clutch installations indicated, and detailed sections of clutch designs recommended for the different uses. Handy reference tables are also given of ratings and dimensions for the different types of Pullmore clutches. A copy of the booklet will be sent on request.



Built for
EXCEPTIONAL
SERVICE

ROCKFORD
INCLINABLE
AND
STRAIGHT SIDE
PRESSES

in all
sizes

THE ever increasing use of heavy sheet metal stampings nowadays in place of castings and the numerous parts formerly made on screw machines, requires presses of greater power and capacity, and that's just what you get in the ROCKFORD.

Rockford Presses are sturdily built of the best materials and incorporate many features that are the result of years of experience in building presses of various types. You can depend upon a Rockford—for it is designed to maintain exact adjustment throughout long runs and under heavy duty.

Write for Catalog

ROCKFORD IRON WORKS
ROCKFORD, ILLINOIS

Strand Adds New Model

N. A. Strand & Co., 5001 N. Wolcott Ave., Chicago, have added to their broad line of flexible shaft machines a new tool and die maker's machine, Type MY-4, consisting of a $\frac{1}{4}$ h. p. motor and three-speed ball bearing countershaft with belt guard. Two combinations of speeds are available — 1700, 3000 and 5200 r.p.m. — and a range of higher speeds including 3400, 6000 and 10,400 r.p.m.

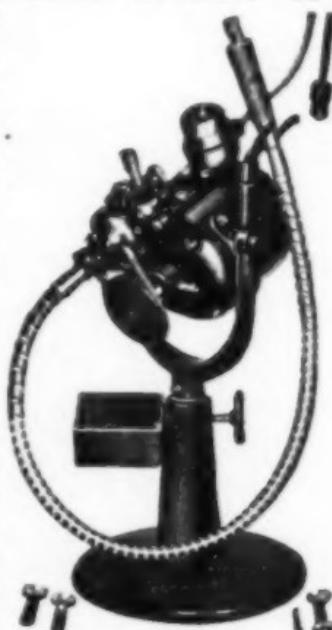
The machine is supplied with either combination.

The motor is mounted on a swivelling yoke, permitting the machine to swivel in all positions.

A 4-foot flexible shaft with a ball bearing hand piece fitted with a split collet is provided with each machine, and a neat tool box is attached to the bench stand. The machine may be raised or lowered to any height by means of an adjusting stud.

Strand has also developed a small bearing right angle attachment, interchangeable with this machine, as illustrated, arranged with a split collet for holding tools with round shanks. This is an extremely useful tool under certain working conditions and is considered an indispensable part of flexible shaft equipment.

Bulletins on these tools are now available and may be obtained by writing to the manufacturer, who will also furnish on request information on other types of flexible shaft machines to suit standard or special grinding and polishing problems.



INCREASE PRODUCTION WITH FEDERAL PRESSES



No. 33 BACK GEARED

Capacity 26 tons
Large area ram face
Large bolster plate
Large opening thru back for bulky work

Designed and built especially for large or bulky light work and for progressive dies such as used in lamination.

All models of FEDERAL heavy duty presses are equipped with Timken bearings to increase efficiency and production at the lowest possible upkeep cost. Roller bearings in the flywheel are adjustable for wear, eliminating the need for expensive rebuilding and repairs after long use and preventing damage to the clutch and control mechanism. Non-repeat safety type clutch and tripping device, also standard equipment on FEDERAL models, guard against accidents to operators or dies should momentum carry the crank-shaft beyond center.

**F E D E R A L
P R E S S C O.
E L K H A R T , I N D .**

Send Coupon No. 68
for illustrated in-
formative circular

Chicago Wheel Co. Develops Soft Rubber Polishing Wheels

The Chicago Wheel & Mfg. Co., 1101 West Monroe St., Chicago, announce a relatively new development in polishing wheels which should find wide application in all types of industry and help to speed-up finishing methods.

Although not offered as a cure-all for all polishing problems, the new wheels in regular production are said to have often supplanted set-up wheels and the final polishing rag or felt wheels, performing a complete operation with one single "CHICAGO" soft rubber polishing wheel.

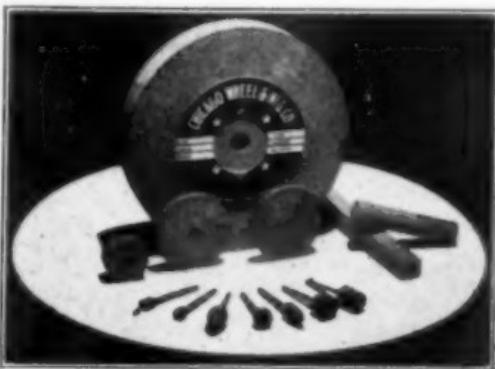
The new "CHICAGO" wheels are soft and flexible, adapting themselves particularly to die work, reaching hard-to-get-at places, cavities, etc., around radii without danger of wheel breakage.

The face may be dressed to any contour. Wheels may be run wet or dry and have sufficient grinding action to remove finish grinding marks from any metal surface. The flexible bond is impregnated with five different types of polishing compound to impart a brilliant finish to any surface.

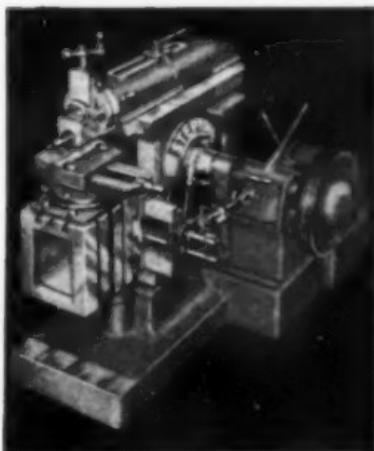
No special equipment of any kind is needed for "CHICAGO" soft rubber polishing wheels, excellent results, it is said, being obtained with relatively low speeds. Surface speeds of 4000 s.f.m. or lower are recommended. In many instances, especially with the larger wheels, surface speeds as low as 2500 s.f.m. have been found very satisfactory.

The new wheels are available in sizes up to and including 8" in diameter, in thicknesses not exceeding 2", and are especially useful with portable electric tools, flexible shafts, etc.

(Continued on Page 62)



POWERFUL MACHINES for HEAVY WORK

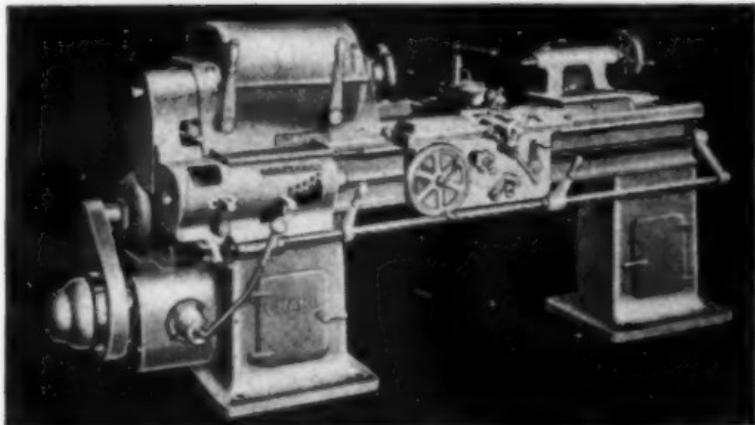


STEPTOE SHAPERS

Force feed continuous lubrication, heavy construction and Timken bearings throughout insure rigidity, accuracy and long life. Centralized controls are within easy reach of the operator at all times.

Instantaneous feed and speed changes may be made with fingertip control while the machine is running.

Send today for catalog No. 130.



CHARD Twelve-Speed All Geared Lathes

Precision Timken or plain bearing spindle—Instantaneous start or stop of spindle—12 speed changes in 15 seconds—Heat treated and hardened gears run in oil in speed box—All shafts mounted on ball bearings—Powerful, accurate, and easy control—Built in 16", 18" and 20" standard engine lathes, manufacturing lathes and tool room lathes.

Send today for full information.

Western Machine Tool Works
HOLLAND, MI **MICHIGAN**

The cutting action of the wheels can be altered in keeping with the requirements of the particular application. However, the polishing or burnishing effect is always present, and the very nature of the wheel and bond lends itself to polishing.

"CHICAGO" mounted wheels are also made with this soft rubber polishing bond and are available in conventional shapes mounted on steel shanks. In tests conducted in representative die shops, these new wheels are said to have cut finishing time on dies as much as one third.

The manufacturers will gladly send full information to any one who is interested.

More Power Hours in Small Motor Field

A new "H" motor is announced by The Dumore Co., of Racine, Wis., pioneer builders of fractional horsepower universal motors.

Available in several different types: ventilated, totally enclosed, sleeve and ball bearing and with worm gear speed reduction units, it is said that this 1/50th h.p. universal motor embodies all the latest features of modern motor design.

Into this unit has been built many of the features which have contributed to the dependability of the larger Dumore units and the new model is asserted to be unusually compact, sturdy and efficient.

The standard totally enclosed motor known as the "H" is rated at 1/50th h.p. at 6500 r.p.m., for 30 minute duty. The standard open motor known as the "HV" is rated at 1/50th h.p. at 5000 r.p.m. continuous duty or 1/55th h.p., at 4000 r.p.m. for 30 minute duty.

Complete engineering details and blueprints are available on request from the manufacturers.



WITTEK

AUTOMATIC
Roll Feeds

For Every Size and Make of Punch Press



**FAST
ACCURATE
AUTOMATIC
SAFE**

Increases Punch Press Production

Keeps production at the same steady high level day in and day out—no fatigue or other human "let down". Easily installed on any press without alteration. Feeds automatically any stock from coils in lengths from 0" to 24" per press stroke. Saves time, operating costs and dies—reduces scrap to a minimum. A type for every requirement—Single Roll, Double Roll, and Compound with straightener.

Wittek Reel Stands

Automatic, Self-Centering, Ball-Bearing. Adjustable to any height, balanced at any angle, 500 lb. capacity. Prompt deliveries from stock. Also made in four other models.

Write Today for Bulletin "HF" giving complete details and specifications of WITTEK Automatic Roll Feeds and Reel Stands.

USE QUICKMAIL COUPON No. 35



WITTEK MANUFACTURING COMPANY

4305.9 W. 24TH PLACE.

CHICAGO, ILL.

A New Mall Grinding Unit

The Mall Tool Company, 7742 South Chicago Ave., Chicago, announce a new grinder known as the "3524-DP". It is equipped with a $\frac{1}{2}$ h.p., 3450 r.p.m., ball bearing mounted constant speed motor. The $\frac{7}{16}$ " diameter by 6 foot flexible shaft rotates within an internal bearing flexible housing, while the angle and straight spindles have large ball bearings for ease of operation and long life. The mounting has large, easy rolling casters, and a tray is provided for tools and miscellaneous attachments.



Like other Mall units, this grinder can be fitted with attachments for disc sanding, grinding, buffing, polishing, drilling and many other applications. The price is unusually low.

Information on this and other Mall units will be sent on request by the manufacturer.

English Company Seeks Agencies

Monolines Limited, 329 High Holborn, London, W. C. 1, England, are looking for sole agencies in the United Kingdom and Ireland for metal-working machines and air conditioning equipment.

**FASTER And More ACCURATE
BLANKING with**

LITTELL

Automatic Centering Reels



Littell automatic centering reels enable one man to load and center heavy coils in less than two minutes regardless of the difference in inside diameters between one coil and the next. Centered coils turning on ball bearings revolve with the greatest of ease. This condition means greater production for both hand feeding and automatic feeding of stock.

These reels are made in three sizes, in both plain and motor driven types.

- No. 3 for 300 pound coils.**
- No. 5 for 600 pound coils.**
- No. 10 for 1000 pound coils.**

Write today for circulars showing types and sizes of LITTELL automatic centering reels.

Use Coupon No. 41 when you send for Littell circulars.

F. J. LITTELL MACHINE CO.

4125 Ravenswood Ave.,

Manufacturers of Punch Press Feeds and Reels

Chicago, Ill.

Progressive Offers New Spot-Welding Fixture

Because of its experience and knowledge of spot-welding problems, the Progressive Welder Co., 737 Piquette Ave.,

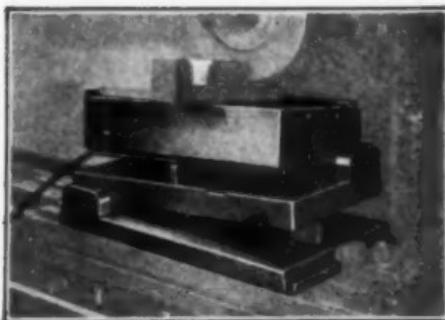
Detroit, should be in position to offer a real service to production and manufacturing plants. For that reason, the new fixture designed for the Progressive Hydraulic Welding Gun should arouse interest. The accompanying illustration will suggest that it is intended for uniting sheet metal parts in medium production systems.

The fixtures are said to be comparatively inexpensive because of the simple method of fabrication, and to more than pay for the extra investment over makeshift set-ups. The parts to be welded are clamped and positioned by quick acting devices so that the finished assembly will fit its corresponding parts. The copper bus bars are cast to fit the parts to be welded assuring uniformly identical assemblies. The transformer and hydraulic booster for the hydraulic welding gun are mounted in the fixture, making a compact unit—an advantage where floor space is limited.

The makers stress the compact and accessible arrangement of all clamping devices, the placing of the work for loading and unloading with minimum handling, and the ease of handling and positioning of the spot-welding gun. To put the machine into operation, air, water and electrical connections are all that are needed.

(Continued on Page 68)





**SHORT SHORT
STORIES ABOUT
The Magna-Sine**



"THEY TOOK IT AWAY FROM ME"

SHORTLY after the MAGNA-SINE was introduced, a demonstration was arranged at one of the automobile plants in Flint, Mich. The salesman returned without his sample.

"They wouldn't let me take it away", he said. "A job was going on the grinders this afternoon which was 'made to order' for the MAGNA-SINE. They put the requisition through while I was there. Now I need another demonstrator."

Did it measure up to expectations on that first job? Here's the answer. That company has since ordered four more.

You too will be enthusiastic about the MAGNA-SINE'S time and money-saving advantages . . . its precision accuracy. If you're not entirely familiar with its adaptation to any job requiring an angular set-up, write for full details. For convenience use **Quickmail Coupon No. 63.**

The MAGNA-SINE ROBBINS ENGINEERING CO.

639 Mt. Elliott Avenue,

Detroit, Michigan

The maker will gladly supply any desired information and co-operate in providing special custom-built fixtures for any spot-welding problem. Quickmail coupon No. 38 will bring an illustrated Progressive bulletin.

New Sterling Box and Bin Rack

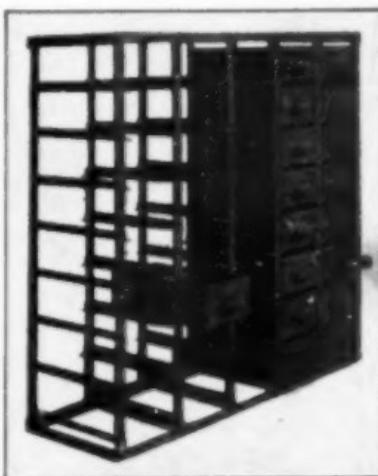
A new rack, which can be furnished to fit any size box, and to go into any size space has been devised by the Sterling Factory Equipment Co., Inc., of Providence, R. I., manufacturers of handling and storage equipment.

The type of construction used makes these racks flexible enough to be adapted to almost any box storage needs. Length of the uprights determines the height of rack—length of box runners the width—and length of angle connectors at top and bottom determines the length of the rack. The welded construction assures rigidity.

The manufacturers say that the racks need not be fastened to wall, and that several may be bolted together to prevent sway. The racks are ready for use when received, and utilize full storage space. It is said that by eliminating the need for cross pieces under the boxes, the space of two 5 inch high boxes is saved in a 5 foot rack. Uprights are stocked in sizes from under bench height up to 5 feet. Runners are stocked to fit boxes 12, 15, 18, 24 and 30 inches long, but can be provided for other sizes. For heights over 5 feet racks are made to fit on top of one another.

The box shown in rack is $10\frac{1}{2}$ inches wide, 6 inches deep and 21 inches long. Other sizes of boxes, bins or trays of steel are made to fit the racks. Full information may be obtained by addressing the makers.

Use Quickmail coupon No. 22 when you write.





**SAVE TIME! GET BETTER RESULTS!
INCREASE YOUR PROFITS!**

with a

Mall **UNIVERSAL GRINDER**

More horsepower per pound of weight in the operator's hands than any other grinder on the market.

It will pay you to investigate this PORTABLE, EFFICIENT, HIGH SPEED machine for grinding and casting snagging. Also, inquire about the various other MALL grinders. There is a type for every job!

Use Quickmail Coupon No. 46

MALL TOOL COMPANY

**7742 South Chicago Avenue
Chicago, Illinois**

Offices and Distributors in all Principal Cities

1000-a-Minute Punch Press

To meet the demand of the blanking industry for higher speed, positive accuracy and lower die costs, the Super Speed Press Corporation has developed a punch press which has a speed of 1000 blanks a minute with one die. It is already in successful use in many large industrial plants.

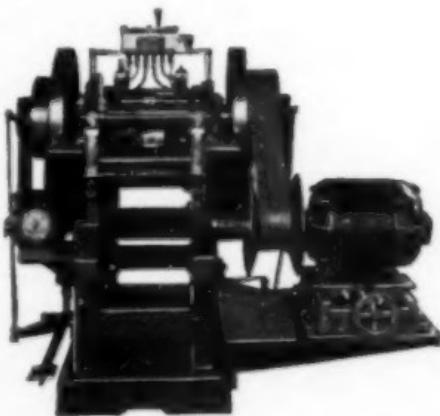
Embodying in this press is a continuous feeder which, according to the manufacturer, can be controlled while the machine is running, is absolutely accurate and never allows the stock to stop or creep. This is accomplished by the use of an oscillating die which moves at the same speed as the feeder.

Adjustment of the stroke is made simple and rapid through an adjustable crankshaft, heat treated and ground. There are no pawls, cams or ratchets in this press to complicate a set-up and adjustment of the feeder can be made in five seconds merely by turning a handwheel.

The machine can be built to discharge blanks at either top or bottom and will handle both roll and strip material. All parts under strain, according to the specifications, are made of manganese molybdenum steel.

At a speed of 1000 strokes a minute, the press can be stopped instantly, the manufacturer says, without jar or vibration. Features of importance are guides below the level of the punch, variable speed drive, ball bearing construction, minimum vibration, progressive dies without pilots and scientific lubrication of material and press.

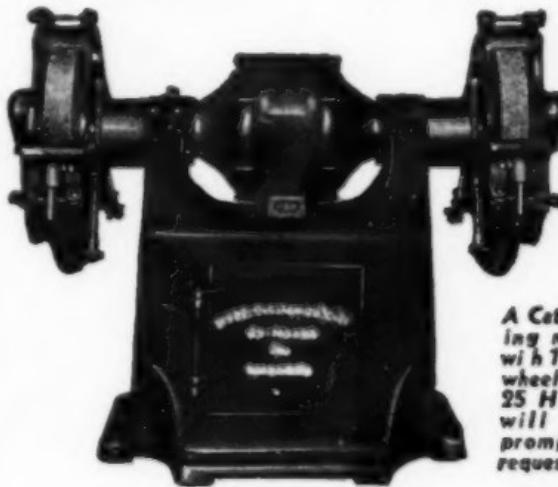
Simplicity, quietness and safety to an unusual degree are other features which should insure this press a welcome from the industry. For literature, write to the Super Speed Press Corporation, 55 Liberty St., New York City.



MARSCHKE

Formerly Van Dorn, Black & Decker

HEAVY DUTY GRINDERS AND BUFFERS



A Catalog showing machines with 10" to 30" wheels and 1 to 25 H.P. motors will be sent promptly upon request.

An important item accounting for the fact that we are now manufacturing the MARSCHKE HEAVY DUTY GRINDERS and BUFFERS, is our own experience with these machines.

We have been using several different types and sizes of Marschke Grinders and Buffers for so long that "the oldest man" of the organization does not remember when they were originally installed.

Nor does anyone remember when any of these machines has given a bit of trouble and since that is the kind of machines we like to use, it's also the kind we like to make and sell.

You, too, will appreciate the dependable durability of Marschke Grinders and Buffers—formerly made by Van Dorn, Black & Decker—now being manufactured by

VONNEGUT MOULDER CORP.
1805 Madison Avenue, Indianapolis, Ind.

Send Coupon No. 47 for catalog.

New Hydraulic Feed Surface Grinder

Gallmeyer & Livingston Co., Grand Rapids, Mich., have just placed on the market a new high speed cross traveling head type of hydraulic feed surface grinder. The model illustrated has 16"x48" working surface of table, but other widths and lengths are available.

The base is a heavy one-piece casting twice the length of the working surface of the table, so in normal operation the working surface never overhangs the base.

The upright column carrying the vertical sliding head is a rigid one-piece casting. It is keyed, bolted and doweled to the base so securely that the two castings are in effect integral. Column walls are $1\frac{3}{4}$ inch thick and stiffened with reinforcing ribs.



Table speed has an infinite variation from practically nothing up to a maximum of 150 feet per minute when driven by a 60 cycle motor. A lever in the center of the front valve plate is provided for stopping and starting and speed control. It operates in approximately a 90 degree arc between the stopped position and full speed.

The cross traveling spindle slide has a movement equivalent to the working surface of either 16" or 18". Thus a 4" standard wheel over-runs the working surface 2" on front and back edges of the table.

The cross traveling movement normally operates at each reversal of the table, and the amount of move-

(Continued on Page 74)

FORMERLY
manufactured by Rockford Machine Tool Co., of Rockford, Ill., thousands of these drills have been installed in plants the country over, where they have been giving universal satisfaction.

Counterbalanced, eight-speed spindle, made from high carbon special steel, has quick advance and return; positive feeds are instantly available while machine is in operation; all controls within easy reach.

DRILLING MACHINES



POWERFUL—SIMPLE— DURABLE—ACCURATE

We have been builders of Drilling Equipment for more than 20 years and, in addition to the above drills, manufacture the Cleereman Automatically Oiled, Anti-Friction, High Speed Drilling, Boring and Tapping Machines; Gang Drills and Special Drilling Machinery.

CLEEREMAN MACHINE TOOL CO.
GREEN BAY, WISCONSIN

(Formerly Green Bay Barker Machine Tool Works)

ment may be set at anything from less than $\frac{1}{2}$ " up to 2" at each reciprocation of the table. The total amount of cross travel in a given direction can be governed by adjustably positioned dogs. When the desired amount of cross feeding has taken place in one direction, it will automatically reverse and cross travel in the opposite direction. A convenient lever is provided for reversing the cross travel by hand, if it is desired to reverse before the reversing dogs contact the reverse mechanism. A small hand wheel in the valve plate provides for adjustment of cross travel. Cross feeding can be instantly disconnected by pulling a small hand lever and the head cross-traveled by hand. Provision is made for easy truing and dressing of the wheel.

The standard spindle drive employs an 1150 r.p.m. 25 h.p. motor which directly drives the spindle through a splined end. Thus the cross traveling mechanism is relieved of the burden of this 25 h.p. motor which is mounted in a fixed position on the vertically traveling head member.

The 16 and 18 inch machines are regularly equipped with 20 inch diameter wheels having 4 inch face, but other sizes may be had on special order. Capacity under the 20 inch wheel is 17 inches. Additional vertical capacity can be provided on special order.

Power elevation of the vertically moving head slide is provided as standard equipment, operated by a $\frac{1}{2}$ h.p. motor, controlled by a double throw switch. When the handle is up, the head travels up and vice versa, remaining operative only so long as pressure is applied.

A large hand wheel in front controls vertical movement of the wheel head. This is graduated in .0001". Equivalent metric graduations may be had optionally at no extra cost.

Wet grinding equipment is standard. The tank is a separate unit on a portable roller base, to facilitate removal and cleaning. Coolant is pumped by an independent motor on top of the coolant tank, with conveniently separable electric and hose connections.

A request to the manufacturers will bring full information pertaining to this machine.



Actual
Size

FEDERAL
Announces
their
MODEL TWO
 $1/10,000''$
UNIVERSAL
TEST INDICATOR
Send for Circular

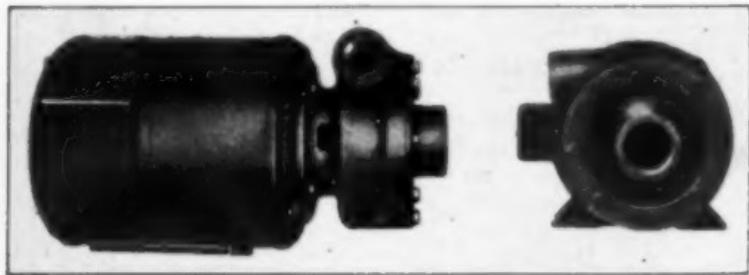
FEDERAL PRODUCTS CORP.
1144 EDDY STREET, PROVIDENCE, R. I.
Detroit . Chicago . Muncie . Cleveland . New York

Send Coupon No. 54 for Catalog

Pioneer Horizontal Coolant Pump

Machine tool builders and users should be interested in this new pump for coolants and lubricants, offered by the Pioneer Engineering & Mfg. Co., 31 Melbourne St., Detroit.

It is of the open impeller type direct connected to a full ball bearing, long hour, moisture-proof motor, and is said to have been designed and built for higher efficiencies and higher heads than conventional types. It is recommended for installations where maximum heads are essential, as in multiple or deep hole drilling, for filtered coolant supplies or in central reservoir systems serving a battery of machines, and is said to offer greater volumetric control and maximum flexibility in application and service.



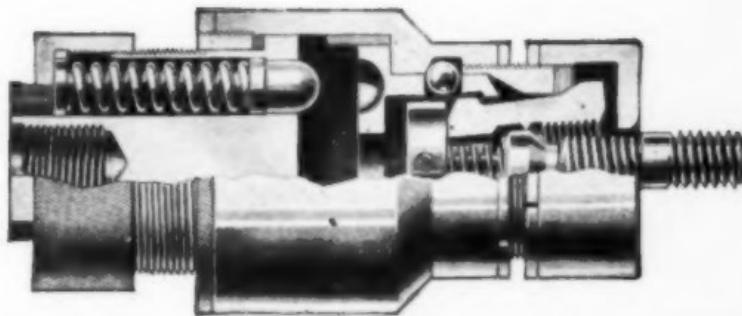
Although normally installed in a horizontal position, this pump is not limited to such applications. Due to the special bearing design, it may be set vertically if desired and the performance will be the same in either case.

A special mechanical seal is used at the shaft opening instead of a conventional packing gland. This permits shortening the distance between the pump bearing and the impeller by from 4 to 10 inches—making the installation more compact with the asserted advantage of eliminating shaft whip.

With this type of pump, increasing the effective head is said to reduce the power demand. When the head is increased to infinity, as it is when the discharge line valve is closed, power demand drops to a point just sufficient to overcome the hydraulic friction of the impeller.

Conversely, it is explained that reduction in the effective head increases power demand in the same

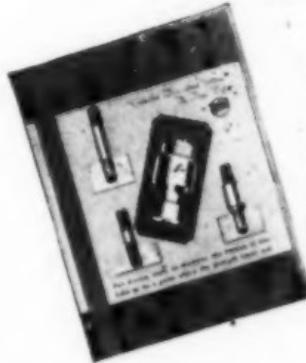
(Continued on Page 78)



TITAN STUD SETTER

Sets Studs to a Uniform
Degree of Tightness without
Strained or Mutilated Threads

The Titan Stud Setter is a new controlled drive type for driving stud bolts, being full automatic in loading and releasing. It is a power-driven unit adaptable to all types of drill presses, air or electric tools, both portable and stationary. Operates at high or low speeds. Positive in driving and automatic in releasing. Studs may be set to any predetermined degree of tightness.



The possibilities of increased production with this tool, due to its capacity, speed range and service, plus the added economy that its safety features assure by automatic operation—all contribute toward making it a tool worthy of investigation and profitable to use.

Send Quickmail Coupon
No. 33 for Illustrated Circular

**TITAN
TOOL
COMPANY**



**FAIRVIEW,
PENNA.,
U. S. A.**

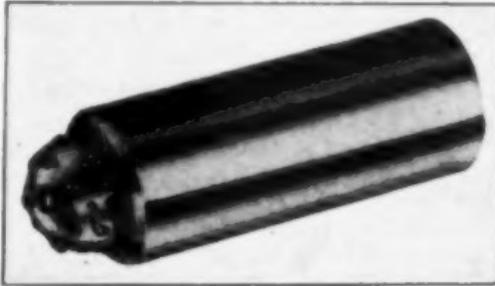
ratio. Thus, a motor operating at capacity in an installation having a very high head will not be suitable if the head is materially reduced because of the serious overloads developed. To avoid any possible operating difficulty of this character the Pioneer Pump is powered for the lowest possible head. Consequently, regardless of how the effective head may be varied, Pioneer Pumps will not suffer overloading from that cause.

Another advantage is that this unit operates at normal motor speeds and no speed reductions are necessary unless highly viscous liquids are encountered.

The makers will be glad to supply full details on request. Use coupon No. 28 when you write to them.

Carboloy Wheel Dresser Prices Reduced

Carboloy Co., Inc., manufacturers of Carboloy cemented carbide tools, dies and wheel dressers announce a reduction in the price of Carboloy diamond-impregnated wheel dressers. Due to improved manufacturing methods the number of standard dressers has been reduced from 9 to 3. These 3 dressers, an example of which is illustrated, are designed for the rough, semi-finish and finish dressing of practically every type of commercial grinding wheel used in the industrial field.



This price reduction and the wider useful range of each dresser is intended to encourage users to apply Carboloy dressers more freely throughout their plants, and economically equip each machine with an individual dresser. It is pointed out that the use of these new dressers eliminates remounting expense, assures more complete diamond consumption, lowers dressing cost and provides more uniform results throughout the entire life of the dresser.

A new revised catalog DR-37 may be obtained, without obligation from Carboloy Co., Inc., 2985 East Jefferson Ave., Detroit, Mich. Send coupon No. 27 for it.

**A RANGE OF
A MILLION VARIATIONS
OF SPEED**

BETWEEN THE HIGH AND LOW LIMIT

Instantly Available With The

**NEW LENNEY VARIABLE
SPEED TRANSMISSION**



The Answer to Your Transmission Problem?

This handy unit is worth investigating for it HAS satisfactorily solved the transmission problem in many plants. It gives a smooth, quiet, vibrationless flow of power, adjustable to a fraction of a revolution per minute with reduction from $2\frac{2}{5}$ to 1 to 8 to 1. Speed is constant even under severe overload. The Lenney Automatic Loading Device prevents slippage. Neat in appearance, with quality construction—built for long life without attention. Can be set to any speed while running or idle.

Built in Motorized and Unit Types from $\frac{1}{8}$ to 5 H. P.

Write Today for Complete Information and Prices

**The LENNEY MACHINE & MFG. CO.
WARREN, - - - - - OHIO**

• Territories Available to Agents of Proved Ability •

Personnel Changes at Carboloy

Carboloy Co., Inc., Detroit, manufacturers of Carbonyl cemented carbide tools, dies and wheel dressers announce the following changes and additions to the personnel of their organization.

Mr. F. C. Ritner has been appointed Assistant to the President, in charge of special wear resistant applications, new developments and special products.

Mr. T. D. Lafferty, formerly of the Detroit District Office of the General Electric Co., has been appointed to the General Sales Offices as Assistant to Mr. Beardslee, General Sales Manager.

Mr. H. C. Stone, formerly of the Newark Office will represent the Company in Brooklyn and New York City territory.

Geneva Precision Dial Indicator

Simplicity of design and ruggedness of construction seem to be the two outstanding features of the new Geneva Precision Dial Indicator presented by the Chicago Dial Indicator Co., 180 N. Wacker Drive, Chicago, which they designate as "The Instrument with the Improved Movement".

The accompanying illustration shows the instrument itself while the cutaways reveal details of the movement.

The manufacturers assert that friction and error are reduced by the employment of the lever arm instead of a gear train.

In substantiation they point out the value of the lever for multiplication as

(Continued on Page 82)



BANISH these Imps of Motor Destruction



**1/4 H. P.
to
15 H. P.**

Use Quickmail
Coupon No. 23
for catalog of
complete line
**Hammond
Grinders**

HAMMOND ELECTRIC GRINDERS
of KALAMAZOO With Totally Enclosed Motors

Hammond Machinery Builders
INCORPORATED
KALAMAZOO, MICHIGAN, U.S.A.

Eastern Branch: 148 W. 23rd St., New York

it has but one pivot point between the driver and driven.

They emphasize that the leverage gives readings through the use of only a few teeth as contrasted with the compounding of gears, and that the lever arm performs the work of a gear $1\frac{1}{8}$ inches in diameter.

Further they point out several decided advantages as a result of the reduced number of parts: lower production cost; reduced friction and greater accuracy; less wear and chance for trouble and repairs.

The special features include a rotating adjustable dial with positive locknut. The top knurled nut operates internal lock for the dial, permitting fine settings.

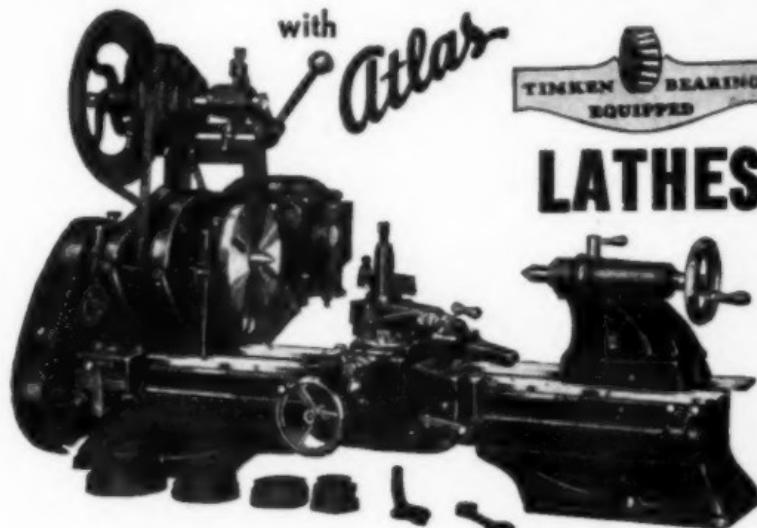
Case and plunger housing are machined from a one-piece nickel-silver casting. The movement is mounted between separate top and bottom plates and the hair spring is mounted between two flat plates to prevent interference with lever rack.

Stainless steel and bronze alloy parts are used throughout to make the instrument rustproof.

The chromium plated, black crystal finish makes a decidedly attractive appearance. The lithographed metal dial makes for clear, easy reading with black letters against a silver background.



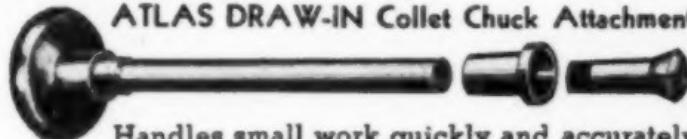
SPEED UP PRODUCTION



LATHES

All those small part production jobs can now be handled easier and quicker on inexpensive Atlas Lathes equipped with Timken Bearings at \$111.50 to \$138.50. Other models \$45.50 and up.

ATLAS DRAW-IN Collet Chuck Attachment



Handles small work quickly and accurately
—capacity $\frac{1}{32}$ " to $\frac{1}{2}$ ".

SEND COUPON No. 34 TODAY FOR THIS NEW CATALOG—



52 pages showing the latest in metal and wood lathes, drill presses, grinders, motors, tools, and attachments.

ATLAS PRESS CO.

750 N. Pitcher St., Kalamazoo, Mich.

Factory Displays at:

CHICAGO
35 E. Wacker at Wabash

NEW YORK
130 W. 42nd St.

PHILADELPHIA
113 N. Third St.

New Wyco No. 30 Flexible Shaft Grinder

Wyzanbeek and Staff, 642 W. Washington Blvd., Chicago, announce a new all-purpose flexible shaft grinder designated as No. 30. It is constructed in three styles:—30A High Stand, 30B Low Stand and 30S Suspension type. Height to center of motor shaft is 28 inches and weight knocked down and in cartons for shipping is 132 pounds. Grinders are attractive in appearance in their high finish enamel with cadmium plated bright parts.



Motor equipment is $\frac{3}{4}$ h.p., 3450 r.p.m., and may be set up for use with A. C. or D. C., and with odd frequencies or voltage—single phase with toggle switch and plug.

The stand has wide legs as will be noted from the illustration, easy rolling casters and a motor carried on a swivel base.

In planning for use in automotive shops the designers suggest the No. 616 WYCO angle head and 9" disc. For industrial shop service a 6" grinding wheel, arbor and aluminum wheel guard are suggested.

The manufacturers will be glad to supply full information on application.

**A Complete Line
of Heavy - Duty GRINDERS
6" to 12" Bench and Pedestal Types**

each
guaranteed
for 1 year



At Left, Our Largest... \$208
Above, Our Smallest... \$19.50

MAIL QUICK MAIL COUPON No. 18 FOR BULLETINS

BALDOR ELECTRIC CO.

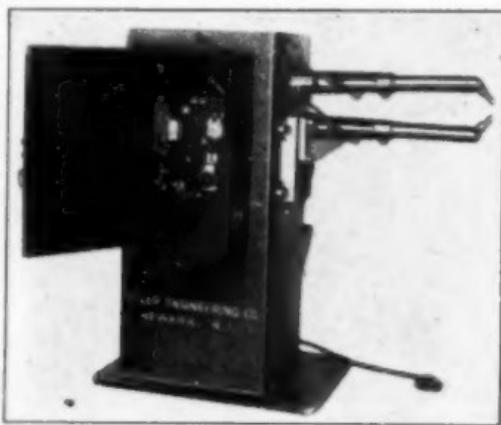
(Electrical Manufacturers for 17 years)
4368 Duncan Ave., St. Louis, Mo.

BALDOR
BALL BEARING **GRINDERS**

New Eisler Welder is Air Operated

Welds on the new air-operated spot welder manufactured by the Eisler Engineering Co., Newark, New Jersey, are controlled by means of a solenoid starter. By depressing the starter, the solenoid actuates the air cylinder which in turn closes the electrodes upon the work. The duration of the welding period is regulated by the automatic timer and contactor, assembled on the side of the fabricated frame. The timer is adjustable to regulate current from 2 to 60 cycles in 110 divisions. An air pressure valve on the machine is used to regulate the proper air pressure; this welder operates on an air pressure of 35 to 60 lbs., depending on the nature of the work.

Variation in type of work is facilitated by the interchangeable arms available on this welder. Arms shaped for welding different types of work can be substituted for the arms illustrated; the lower arm can also be raised or lowered to conform to the depth of work required. This welder is



especially equipped with strong arm supports. These supports make possible the long arms, and, at the same time, permit the arms to slide in or out of the supports to suit the type of work being welded. A water cooling arrangement passes water through the arms, electrode holders, and electrodes—water is circulated very close to the end of the electrodes. The arms on this welder are 36" long; arms can be supplied from 36" to 48" in length.

This welder is capable of making up to 100 spots per minute and is equipped with an 8-point hand wheel for heat regulation and with an air-cooled transformer.

If you are interested in purchasing a machine of this type, tear out Quickmail coupon No. 62 and send it to the Eisler Engineering Company.

MORE POWER TO YOU
WITH THE NEW



No.
30

FLEXIBLE SHAFT GRINDER



Complete with
Grinding Equipment,
for Industrial Shop
use.

\$82.50

Made in Three Styles
No. 30 A, - High Stand.
No. 30 B, - Low Stand.
No. 30 S, - Suspension Type.

COMPARE QUALITY!
COMPARE PRICE!

Complete with 1"
Angle Head for
Auto Body Shops.
\$91.50

For D. C., or add
cycles or voltage.
—add,
\$10.00

THE NEW "WYCO
Roll-Easy" 3
Wheel Truck
mounting can be
furnished at.—
\$10.00
extra

FLEXIBLE SHAFT: 7 ft. long, size No. 30
with "WYCO Non-Metallic Inner Liner". Finest
quality $\frac{1}{2}$ inch diameter inner core.

MOTOR: $\frac{1}{4}$ H. P. 3450 R.P.M. Repulsion
Induction Type, 60 cycle, 110-220 volt, Single
Phase, with toggle switch, cord and plug.

Send Coupon No. 19 for
the WYCO catalog.

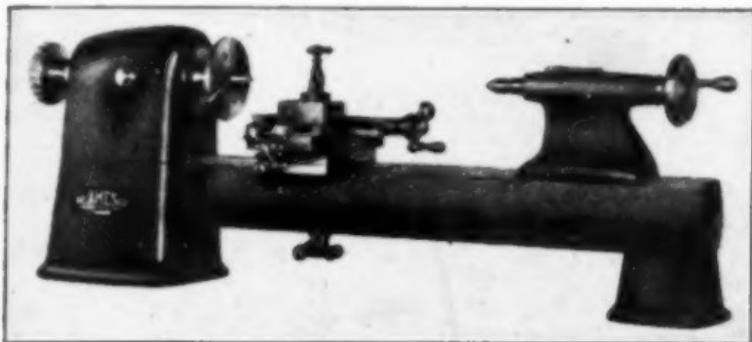
WYZENBEEK & STAFF, INC.

642 WASHINGTON BLVD.

CHICAGO, ILL.

Ames Announces New Enclosed Head Precision Bench Lathe

Increased power for heavier cuts, higher spindle speeds through direct motor drive and fully enclosed driving belts are attractive features of the new EH3 precision bench lathe announced by the B. C. Ames Co., of Waltham, Mass.



The EH3 permits machining small parts with extreme accuracy; doing second operation work on parts taken from automatic machines to bring them to final size; development and maintenance of tools and fixtures; model and experimental work, and the manufacture of small parts with fast operating attachments.

As will be noted from the illustration, the new Ames Lathe presents a clean-cut, attractive appearance. A leaflet giving a complete description of the EH3 will be sent on request.

Ajax Presents New Flexible Coupling

Ajax Flexible Coupling Co., Westfield, N. Y., announces a new model S-2 flexible coupling with a maximum bore of 2-inches. This new S-2 coupling is a useful addition to their complete list of couplings for direct connected machines and is rated at 12½ h. p. at 100 r.p.m. The torque rating is 660 ft. lbs. and maximum r.p.m. 7500. Overall diameter is 6½ inches. Model S-2 couplings are of the same rubber-cushioned design as other type "S" units which are stocked with bores from 1¼ inch up. A specification sheet will be sent on request.

SHELDON

ARBOR PRESSES and VISES



Plain and Swivel
Milling Machine Vises
4 Sizes
3½ to 8½ inch Jaws

Arbor Presses
12 Sizes
From ¾ to 10 ton
Pressure



Shaper Vises
2 Sizes
12 and 14 inch Jaws



Drill Press Vises
3 Sizes
4½-6½ and 9 inch Jaws

*Use Quickmail Coupon
No. 15 for Catalog and
Price List*

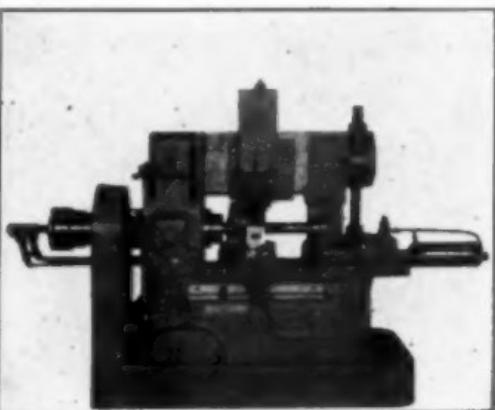
SHELDON MACHINE CO.
3957 Cottage Grove Ave., Chicago, Ill.

Third Slide For Lo-Swing Imp Lathe

Seneca Falls Machine Co., Seneca Falls, N. Y., announce that a third slide or overarm is now available as a standard attachment for any of the new style Lo-Swing Imp Lathes.

The operation of this third slide is synchronized with the other turning and facing slides and is entirely automatic. It may be used for taking a finishing cut after roughing with tools on the rear slide or for chamfering and similar operations. The slide is heavy enough so that it may be used for a roughing operation, if desired.

Operation is by means of a cam on the main cam-shaft. Means are provided for quickly setting this cam so that the third slide may be timed to suit the particular job. Full details may be obtained from the manufacturer.



The Cincinnati Milling Machine and Cincinnati Grinders Inc., Cincinnati, Ohio, announce they have ready for distribution Bulletin M-748, illustrating and describing the Cincinnati High-Speed Universal Milling Attachment.

Pratt & Whitney Division, Niles-Bement-Pond Company, Hartford, Conn., announce they have ready for distribution Circular No. 428 illustrating and describing the Pratt & Whitney John-Sons Roll Thread Snap Gages, Tri-Roll Gages and a new combination of Taper Plain and Thread Plug and Ring Gages.

Hardinge Brothers, Inc., Elmira, N. Y., have issued a new catalog giving complete details of the "Cata-tract" line of precision bench lathes, milling machines, hand screw machines, screw cutting lathes, and collets for all machines.

DRILL JIG



BUSHINGS



Standardized

Prompt delivery from stock
on over 10,900 standard items
— over 6700 ACME Standard — over 4200 A. S. A.
Standard — all completely finished ready for use.
Special sizes made to order.

Made in our new plant by the
most exacting and scientific
methods — insuring accurate
fit plus long wear — concentric
within .0003" full indicator
reading.

Types shown at left, top to
bottom, are: plain stationary
press fit, type 'P'; shouldered
stationary press fit, type 'S';
removable slip, type 'R'.

Send *Quickmail* Coupon
No. 39 for bulletin containing
complete data and low prices.
Satisfactory service guaranteed.

A C M E
INDUSTRIAL CO.
210 N. LAFLIN ST.,
CHICAGO, ILL.

NICHOLSON EXPANDING MANDRELS



They act as internal chucks for holding work while being machined on lathes, millers, grinders or shapers. Made in 14 different sizes taking bores of every fractional part of an inch from $\frac{1}{2}$ " to $\frac{7}{8}$ ". Sold singly or in sets. Write for Bulletin 530.

CONTROL VALVES 2, 3 and 4 Way Types



For operating air, water, steam or oil, single and double acting cylinders. Made in lever, foot, solenoid and motor operated styles for pressures up to 300 lbs. Hydraulic Valves up to 4000 lbs.



Send Quickmail Coupon No 45 for Bulletin.

Other Products—Arbor Presses, Flexible Couplings, Steam Traps, Steam Separators, Steel and Stainless Steel Floats, etc.

W. H. Nicholson & Company
117 Oregon Street, Wilkes-Barre, Pa.

KRW Hydraulic and Sensitive ARBOR PRESSES

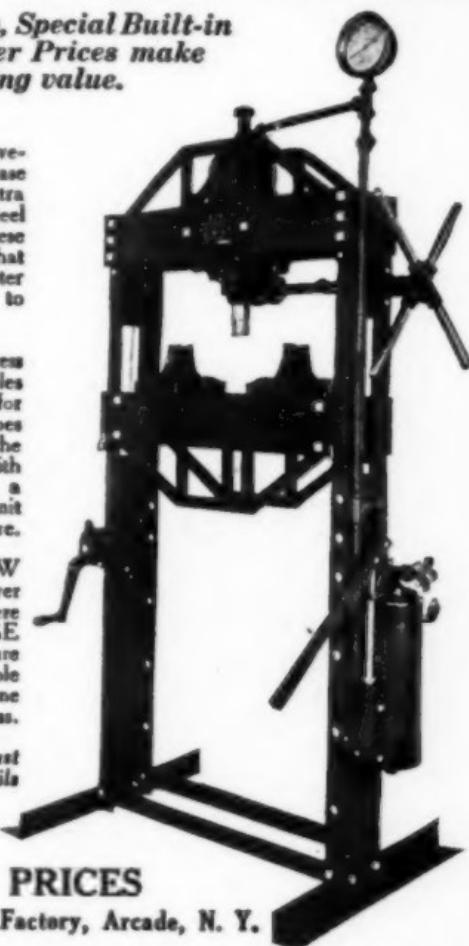
New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.

THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this K R W feature as a time and labor saver can be appreciated. Also there is NO EXTRA CHARGE for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.



PRICES

F. O. B. Factory, Arcade, N. Y.

No. 37—35 ton Hydraulic and Sensitive Arbor Press	\$150.00
No. 37E—50 ton Hydraulic and Sensitive Arbor Press.....	180.00
No. 37F—70 ton Hydraulic and Sensitive Arbor Press.....	300.00
Gauge and fittings, \$15.00 extra on all presses.	

K. R. WILSON

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90 West St., New York, N. Y.

WEST COAST BRANCH
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THE ONLY TAPPER WITH A LEATHER CLUTCH

Ettco - Emrick

TAPPING ATTACHMENTS

ETTCO pioneered sensitive tapping 15 years ago with a leather lined friction driving clutch.

As yet we have found no substitute to equal the smooth, consistent super-sensitive action of leather for the exacting requirements of tapping.



The 1937 clutches have about double the "pull" and wear. Taking the Tapper apart and changing clutches is now a matter of a few minutes.

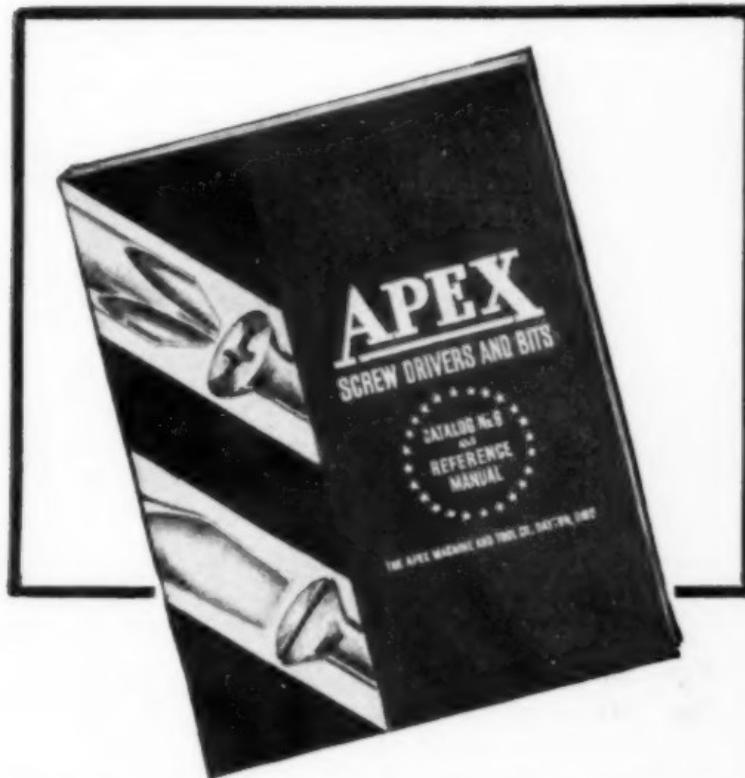
The Tappers have ball bearing spindles — needle bearing intermediate gears and all helical gears to insure the greatest possible speed.

**The Tap Idles "In"—Not Reverse—
This Means Better Holes and Far
More Tap Life.**

*Drop us a line for our catalogue.
Send Quickmail Coupon No. 49*

These tappers are used with the ETTCO multiple tapping system and our No. 71 gravity foot operated tapping machine.

ETTCO TOOL CO.
594 JOHNSON AVE. BROOKLYN, N. Y.



THIS CATALOG

is of real importance to any user of Phillips Recessed Head or Slotted Head Screws.

Complete information on all kinds of Power and Spiral Screw driver bits to fit all makes of Electric, Air and Spiral screw drivers.

Write for your copy on your Company letterhead.

**USE QUICK
MAIL
COUPON
No. 61**

The APEX
—MACHINE & TOOL CO. Dayton, Ohio—

QUICKMAIL COUPONS

HOW TO USE THEM

1 Stick Coupon on your letterhead giving your name and position

OR

2 Stick Coupon on front of postal card, giving your name, position and firm name on back of card.

IMPORTANT!

Advertisers will not acknowledge inquiries unless you tell them what firm you are with, and your position with the firm.

**A SIMPLE - SPEEDY - SERVICE
FOR YOUR CONVENIENCE**

ERRINGTON HYSPI

Super-Sensitive Ball Bearing

Cone Drive

2 to 1 Auto-Reverse Tapping Chuck

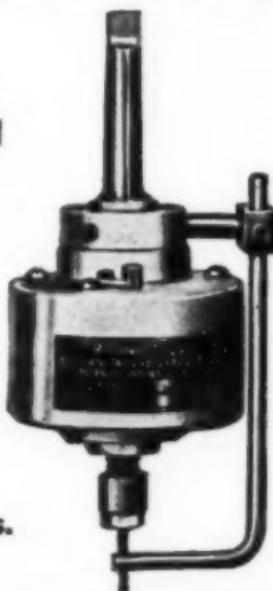
Combination
Bronze & Ball

Bearings
Thru-Out

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Easy and
Economical
Replacement
of
Cone-Clutches.

Depth gauge
facilitates
Quick-Handling
Especially
on
Bottom-Holes

—
Other Styles
and Sizes
0" to 2" taps



Size	Taps in Steel	Taps in Cast Iron	Price	Code
No. 00	0" to 3/16"	to 1/4"	\$35.00	Phlam
No. 0	to 5/8"	to 1/2"	\$50.00	Phalanx

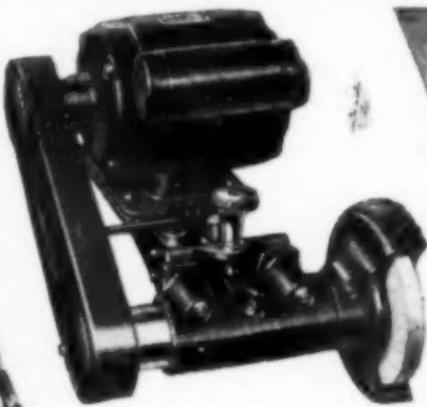
The principle on which this Style is designed is especially effective on very small tapping; whereas in the No. 0 size the Frictional Grip is Greatly INTENSIFIED, to cover a wider range, without loss of sensitiveness.

Errington Mechanical Laboratory

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It's the "Chief"—a brand new 1 H.P. grinder—especially built for heavy internal or external work . . . Here is a tool that has ample power to remove large amounts of stock—greatly increase production—and at the same time maintain precision tolerances of $1/10,000$ of an inch.

PRECISION-BUILT THROUGHOUT

The "Chief" has a dynamically-balanced constant-speed motor—A. C. or D. C. totally enclosed . . . selected split-tolerance ball bearings in both motor and quill . . . Six Dumore quills with patented ★ automatic lubricating system . . . one for external work and 5 for internal, grinding to depths of 6, 12, 16, 20 and 24 inches. Quill speeds vary from 3,450 to 8,200 r. p. m., giving correct speeds to wheels from 8 inches to 3 inches in diameter . . . A Dumore distributor near you will gladly give demonstrations—without obligations.

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THE DUMORE CO., Dept. 247-G, RACINE, WIS.

* U. S. Patent No. 1,859,068

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Brake
Lathe Unit.

HARDINGE
BROTHERS, INC.
ELMIRA, N. Y.

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Hardinge
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WYZENBECK & STAFF

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Stick this coupon on your letterhead and sign name, title and firm for data on the new Cincinnati wet abrasive cut-off machine.

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BALDOR ELEC. CO.

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31

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WELLS MFG. CORP.

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ROSS OPERATING
VALVE CO.

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36

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L-W CHUCK CO.

30

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OUTSTANDING TOOL VALUES



Working Surface $5\frac{3}{4}$ " wide, 13" long. Consumes .5 Amp.



Demagnetizing Switch for
L-W Magnetic Chuck \$8.75

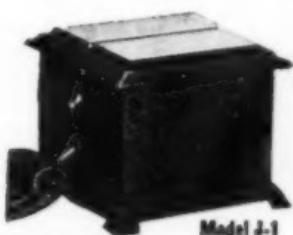
L-W MAGNETIC CHUCK

Waterproof for wet or dry grinding

A REAL MAGNETIC CHUCK that is adaptable for any purpose. Unconditionally guaranteed to furnish the highest magnetic holding power on either 110 or 220 volt direct current. Well designed and beautifully finished, highest quality workmanship throughout—complete \$45 with cord and plug—an outstanding value.

Also made in the following sizes:
 $6\frac{1}{2} \times 18$ "—\$60 8×24 "—\$120 $10\frac{1}{4} \times 37$ "—\$195

NEW, IMPROVED DEMAGNETIZERS

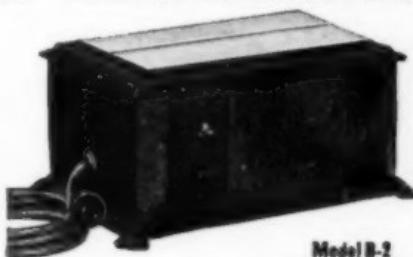


Model A-1

\$45.00

Complete with switch and cord ready for use. Operates on 110 Volt A. C. Current.
 $7\frac{1}{4}$ " wide, $7\frac{1}{4}$ " long, $6\frac{3}{4}$ " high.
Shipping weight 35 pounds.

To meet the demand for a Demagnetizer that would properly fill the requirements of taking the magnetism out of work that has become magnetized through induction, we have designed and built two models for large and small work. A single pass over the stationary poles is sufficient to demagnetize the work completely. • Use Quickmail Coupon No. 36



Model B-2

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Complete with pilot light signal, switch and cord. Operates on 110 Volt A. C. Current.
 $7\frac{3}{4}$ " wide, $12\frac{1}{2}$ " long, $6\frac{3}{4}$ " high.
Shipping weight 55 pounds.

L-W CHUCK CO., TOLEDO, OHIO

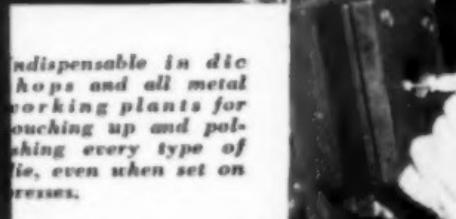
HANDEE



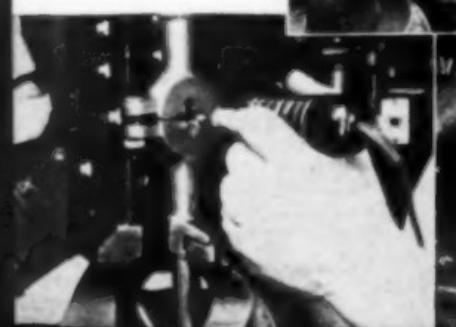
The De Luxe Handee pays for itself many times over, often on the job.



Reaches those hard-to-get-at places. Its light weight and ease of handling in any position save time on a wide range of operations.



Indispensable in die shops and all metal working plants for Touching up and polishing every type of job, even when set on fixtures.



The most versatile tool—actually a whole shop in one. More than 2000 models available.

Indispensable in model experimental laboratory production line in large

For making, shaping metal products, alloying materials, wood, precision jobs and places on intricate parts without removing parts from machine.

The finest, fastest and easiest tool for its type—only 12 ounces. Speed, 25,000 rpm; portable; simply plug into a standard 110 volt, A.C. outlet.

Try a Handee—you'll find its smooth, rapid, accurate response and the wide variety of attachments it will do.

Order one Today on

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TOOL OF 1001 USES

versatile tool ever offered—
while shop full of tools in
than 200 accessories avail-

le model and tool room,
l laboratory, on the pro-
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, shaping, polishing all
cts, alloys, glass, composi-
ls, wood, stone, etc. For
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intricate machine parts,
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ee—you'll be amazed at
rapid, almost human re-
the wide range of work

Today on 10-Days Trial.

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- Drills
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- Routs
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- Carves
- Polishes
- Engraves
- Sharpens
- Cuts
- Cleans



Quickmail Coupon No. 3
For Trial Offer, use
Quickmail Coupon No. 70

Or Later
Model.

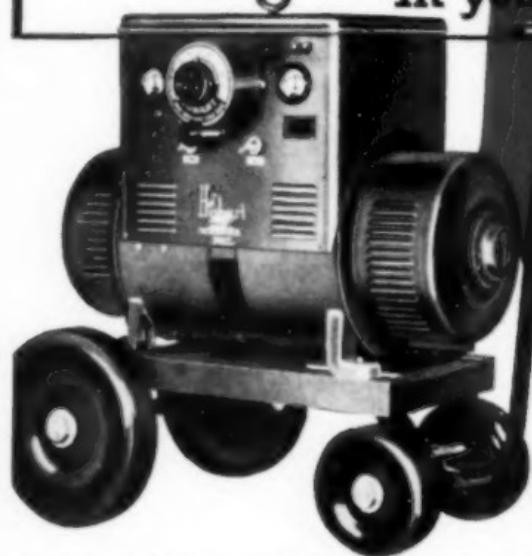
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AND MFG. CO.**

1011 W. Monroe St., Dept. RR, Chicago, Ill.

\$18.50

postpaid

This New 40 Volt Arc Welding
will save hundreds of dollars
in your plant



30 DAYS
TRIAL
in your shop,
at our risk
PROVES
its your biggest
money-making
tool

It's Easy to Own!

Don't go another day without getting facts about this amazing machine which cuts costs squarely in two in pattern work, tool room maintenance, production, salvage.

**THE NEW HOBART 40 VOLT
"SIMPLIFIED" ARC WELDER**

which comes to you on 30 days trial—which has features made others leave off—which costs you less to operate—which handles either plain or coated rod with ease. The coupon below brings complete details. Send Coupon No. 51 to Hobart Bros., Box TB-77, Troy, Ohio. One of the world largest builders of arc welders.

HOBART

THE FASTEST SELLING WELDER IN THE MARKET

Hobart Bros., Box TB-77, Troy, Ohio

Gentlemen: Please send me, without obligation, complete details on the new Hobart 40 Volt Arc Welder for use in

Also the complete catalog.

Name _____

Address _____

FREE!
IF YOU ARE
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IN THE HOBART
ARC WELDERS



Per your ad. In July
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Please send information on
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the Lathe Grinder.

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W. H. NICHOLSON

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COLONIAL BUSHINGS, INC.

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Stick this coupon on a postcard or letterhead and mail to receive a rivet price list and illustrations of Chicago Automatic Rivet Setters.

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MACHINE CO.**

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PRECISION TOOL CO.

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SUPER SPEED PRESS CORP.

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Stick coupon on letterhead or postcard and sign name, title and firm for your new Catalog on Federal Test Indicators.

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SUPER SPEED
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T-W Welder.

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Box TB-77
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General
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on
the T-W
welder.

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on
Test Indicators.

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COLONIAL
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vise.

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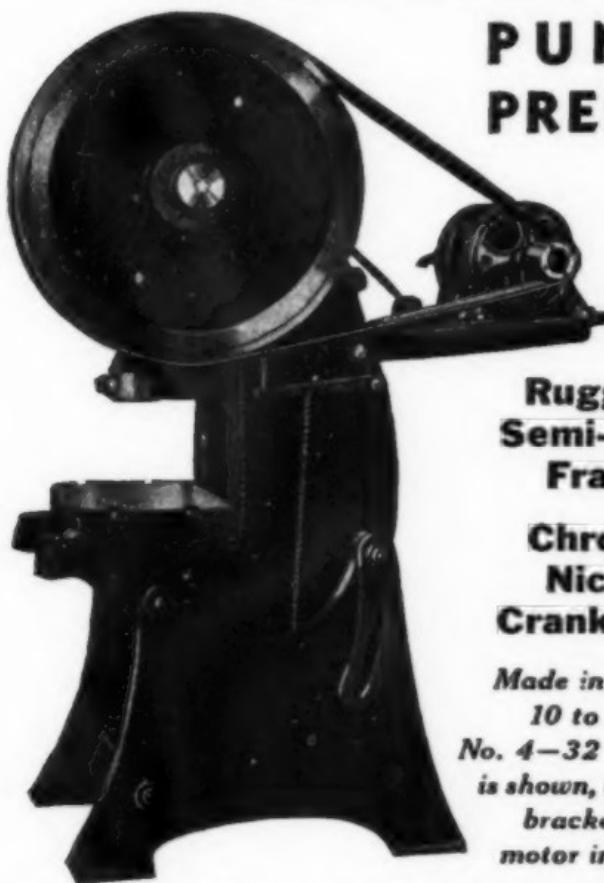
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303 Straight Ave.
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MICH.

MARSHALLTOWN

Open Back Inclinable

PUNCH PRESSES



Rugged,
Semi-Steel
Frame

Chrome
Nickel
Crankshaft

Made in Six Sizes.

10 to 70 tons

*No. 4—32 Ton Press
is shown, with motor
bracket and
motor installed.*

Here's the answer to your punch press problems—a modern line of sturdy, speedy, safe and economical press equipment—engineered for long life and low production costs. We'll gladly supply you with full information on our punch presses and other metal working equipment—throatless shears, bevel shears, bending rolls, etc.

Phone or write—or send Coupon No. 43 for catalog.

MARSHALLTOWN MANUFACTURING CO.

900 East Nevada St.,

Marshalltown, Iowa

LINLEY High Speed Vertical Bench Miller

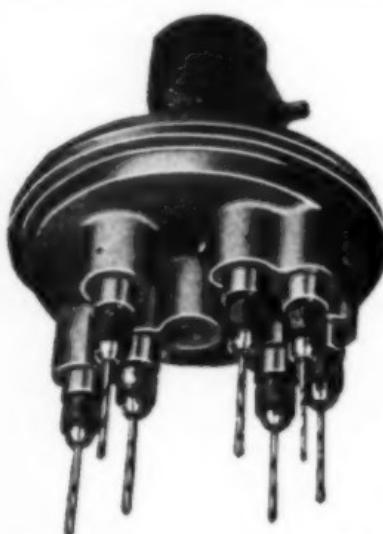
An ideal machine for all small die, jig and tool work of all kinds on laying out, milling, drilling and boring operations.

Substantial savings are made in its simplicity and speed and in releasing heavier machines for larger work.

Table Dimensions

5½" x 14½"

LINLEY BROS. CO.
579 Fairfield Ave., Bridgeport Conn.



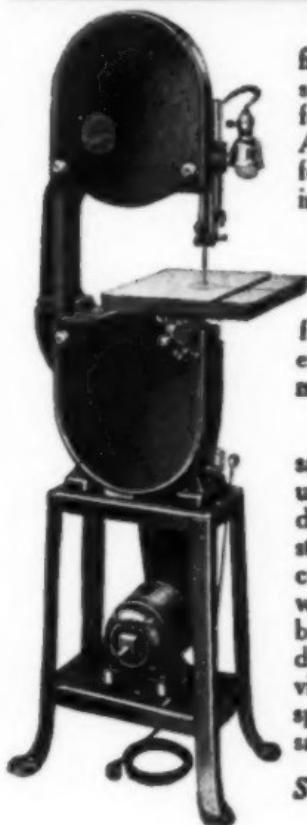
SELLEW KOST CUTTERS

Why drill holes one at a time when SELLEW heads drill all at once in any formation?

Send us your specifications

**SELLEW MACHINE TOOL CO.
PAWTUCKET** **RHODE ISLAND**

New Metal Cutting 14 inch BAND SAW



The regular 14-inch Delta Band Saw, fitted with countershaft to reduce the speed, has been used in hundreds of shops for cutting Iron, Steel, Brass, Bronze and Aluminum bars, shapes and sheets; in foundries, for cutting off gates, in die-casting shops for trimming and sawing castings.

Here is a new and improved back-geared model which is even more ideal for this work. It is the perfect machine for the general machine shop, tool room or experimental shop, where many different materials must be cut.

It takes the place of a power hack saw in cutting off bars and shapes; it is used in the toolroom for sawing off tool, die and fixture stock; it will cut uniform strips from sheets; it saves hours of time in cutting templates and similar tools, and will cut almost any material, such as asbestos, mica, vulcanite, fiber, etc. . . . difficult to cut by ordinary means. Provision is made for four low metal-cutting speeds and one high speed for wood sawing.

Send Coupon No. 29 for special circular giving full details and specifications.

\$79.50

tting blade. Without light attachment, belts, stand, motor or motor pulley. Shipping weight 175 lbs.

14" Back-geared Metal-Cutting Band Saw, complete with guards, 8" arbor pulley for wood and cone pulley for metal. With one 14-tooth metal-cut-

DELTA MANUFACTURING CO.
670 E. Vienna Ave.,

Milwaukee, Wis.



SENECA FALLS Automatic WORK DRIVER

Self Centering . . . Quick Acting . . . No slip. Attaches to any chuck plate or spindle. Provides a slip-proof, balanced drive reducing chatter. Handles rough forgings or turned pieces—straight or taper. Eliminates dogging time. Reduces tool breakage. Write for details and size range.

SENECA FALLS MACHINE CO., 314 Falls St., Seneca Falls, N. Y.



New Drill Grinding Attachment

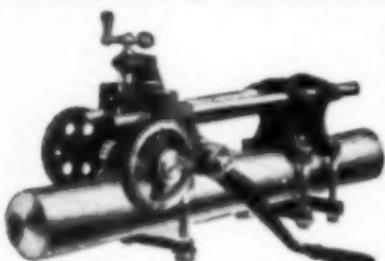
fits the Black & Decker Grinders, gives you a correct grinding of twist drills.

PRICE ONLY \$18. Why not own one that you may be able to grind your twist drills the way they should be ground.

Write to

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13-15 Main Street N. E.
Minneapolis, Minn.

BURR Portable Keyseaters



Indispensable for repair and maintenance work. BURR keyseaters mill keyways in the run or on the ends of shafts while they are still on the machine—accurately, quickly, economically—and save the necessity of taking down large shafts and housings. Made in 7 sizes, hand or power driven.

JOHN T. BURR & SON
429 Kent Ave., Brooklyn, New York

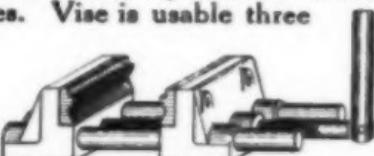
OWN A REAL DRILL VISE

Jaws 5 in. wide, hardened, reversible; open 5 in. Hold round, square and odd shapes. Vise is usable three ways. Satisfaction or no obligation to you.

Write for information and folder.

Only \$12.50

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CAD
Standardized
set-up appliances

Why force your men to waste time on
machine tool table set-ups when CAD
standardized appliances will convert
this non-productive time into pro-
ductive labor?

**STANDARD SHOP
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Set-up appliances for machine tools
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ACE

ARC WELDERS

With Exclusive Feature

SYNCHRO CONTROL

Portable, general purpose welders adaptable to requirements of manufacturers and repair shops, for arc welding in any position steel from 22 gauge up, also for iron castings. Performance equalled by only few successful D. C. Arc Welders.



**Only \$135 for complete
150 Ampere Outfit**

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624 Cross St., Benton Harbor, Mich.



Triplex
Lag
Bolt

Good LAG BOLTS

TRIPLEX makes for good behavior on the job. From American standard square heads through clean shanks and true cut threads down to business-like gimlet points, they're precision made. All heat-treated, quenched in rust-preventing oil.

Write for samples, catalog, prices.

THE TRIPLEX SCREW CO.
5377 Grant Ave., Cleveland, Ohio

Complete
Line of

TRIPLEX

CAP AND SET SCREWS, BOLTS AND NUTS

**A precision measuring tool
that any toolmaker or machinist will value**



MAUSER
Toolmaker's
CALIPER

Price

\$12.00

Range of measurement, 7 in. (other models, slightly higher in price, 9 and 11 inches). Micrometer adjustment. Reads in sharply defined graduations to 1/1000 of an inch, 1/128 of an inch, 1/50 mm. Made of finest tempered tool steel—glass hard measuring surfaces, lapped flat to extreme accuracy under light wave interference test. Can be supplied with detachable base and scribe, as height gage. A triumph of the toolmaker's art, and worth many times its price. Write for 15-page free catalog describing all Mauser Calipers. Shop agents wanted—ask about quantity discount.

GEORGE SCHERR COMPANY

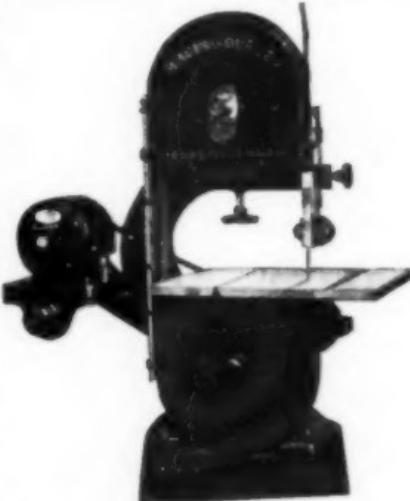
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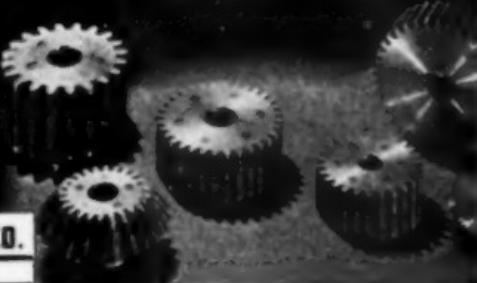
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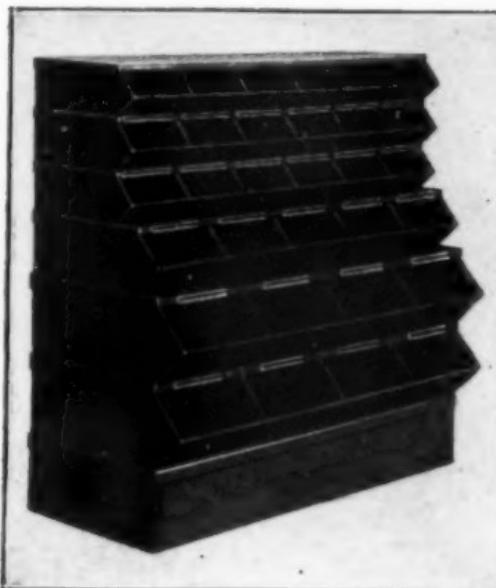
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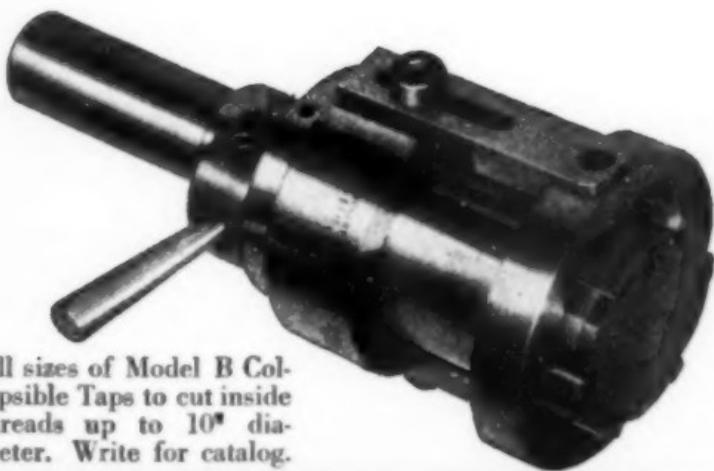
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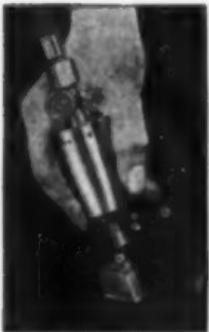


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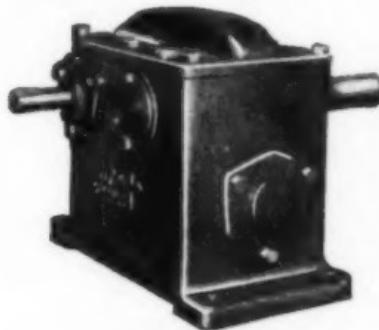
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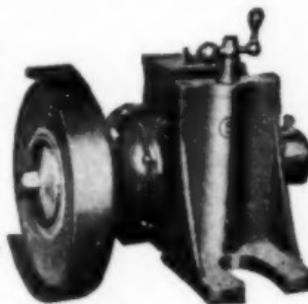
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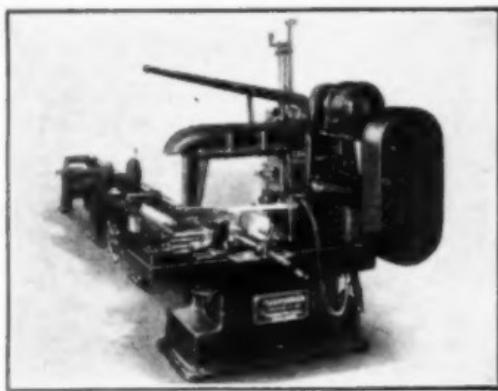
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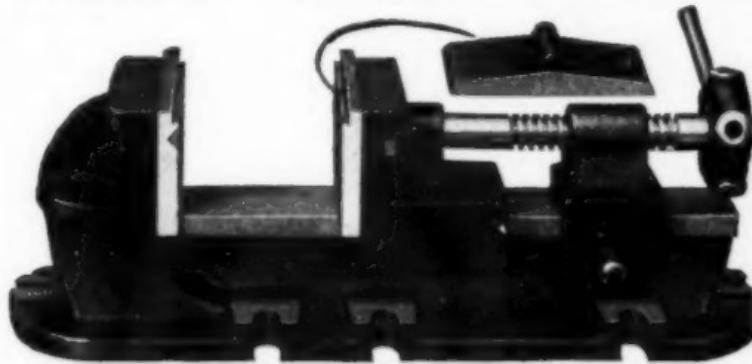
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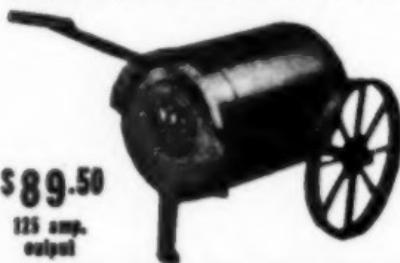
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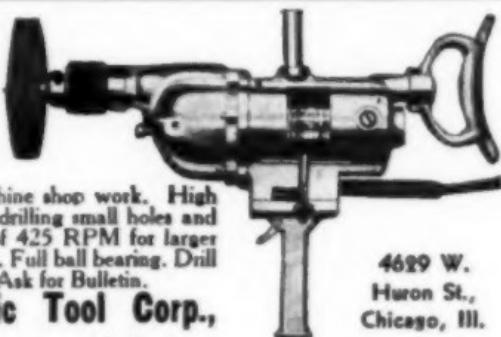
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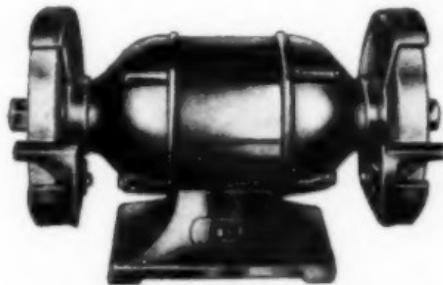


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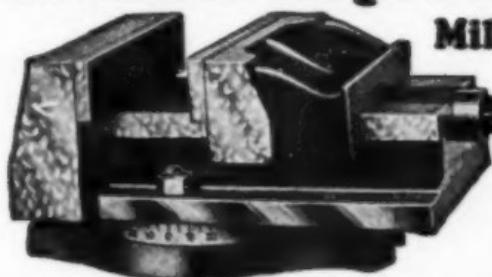
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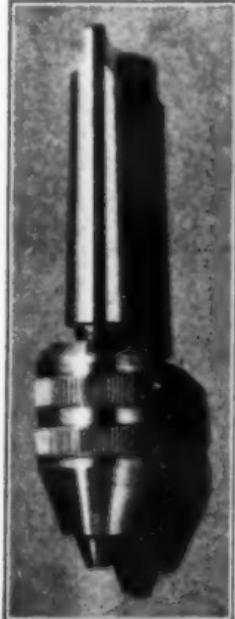
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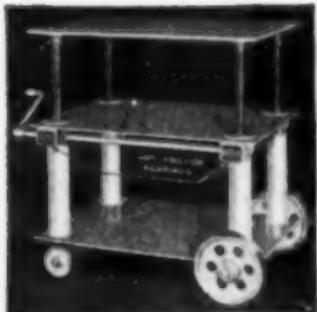
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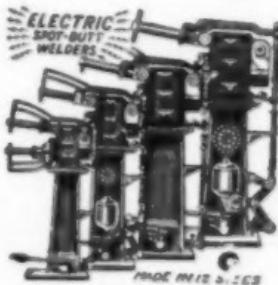
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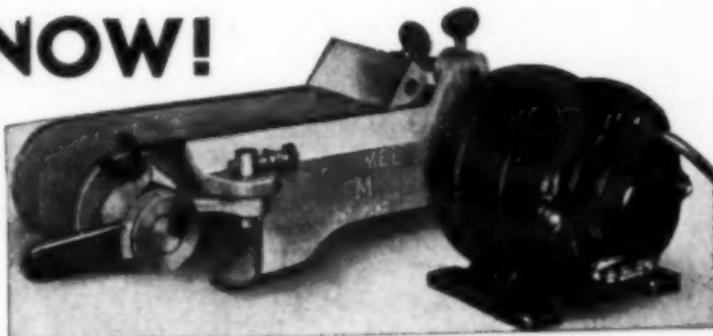
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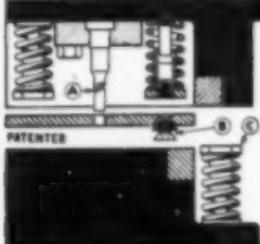
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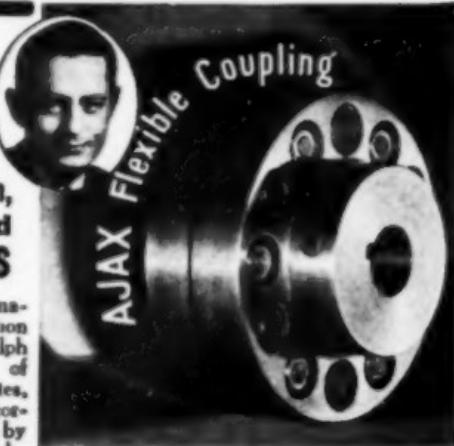
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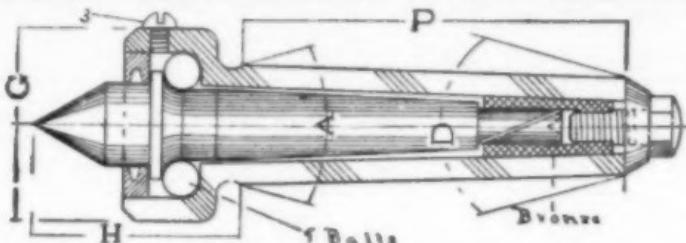
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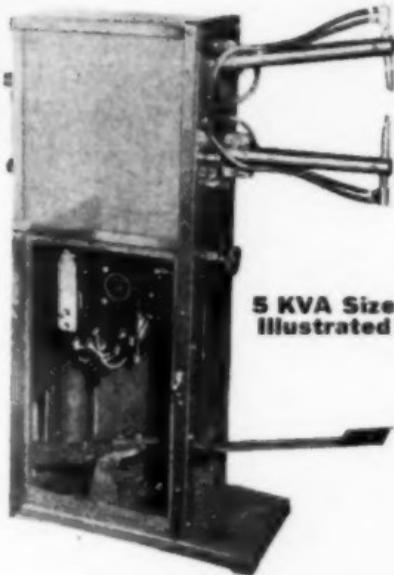
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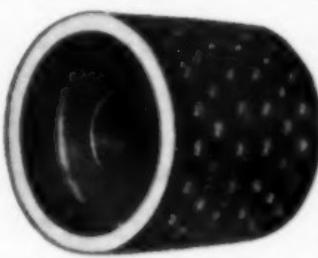
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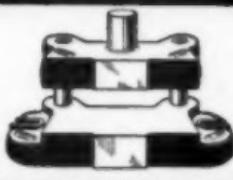
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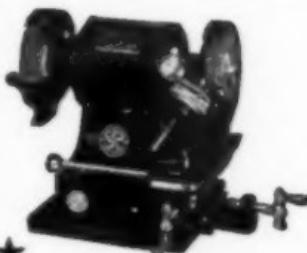


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National Machine Tool Co., Racine, Wis.

Strand Co., N. A., 5001 N. Lincoln St., Chicago

New Dental Mfg. Co., 10 E. 49th Street,

New York, N. Y.

Grinding Machines, Surface

Gallmeyer & Livingston Co., Grand Rapids

Rogers & Co., Samuel C., Buffalo, N. Y.

Grinding Machines, Tap

Gallmeyer & Livingston Co., Grand Rapids

Grinding Machines, Tool

Hammond Machinery Builders, Kalamazoo,

Rogers & Co., Samuel C., Buffalo, N. Y.

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding Service

Machinists Tool Grinding & Mfg. Co., 3038

W. Van Buren, Chicago, Ill.

Grinding Wheels

Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels, Mounted

Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels On Shafts

Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Hack Saw Blades

Armstrong-Blum Mfg. Co., 841 N. Franklin

Ave., Chicago

Hack Saw Machines

Armstrong-Blum Mfg. Co., 841 N. Franklin

Ave., Chicago

Wells Mfg. Corp., Three Rivers, Mich.

Hammers, Electric

Wodeck Electric Tool Corp., 2029 W. Huron

St., Chicago, Ill.

Hammers, Tinner

Whitney Mfg. Co., W. A., Rockford, Ill.

Hammers, Mallets and Malls

Chicago Mawhile Mfg. Co., 1200 Elston Av.,

Chicago, Ill.

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.

Hammers, Soft Faced

Greens Tweed & Co., 100 Duane St.,

New York, N. Y.

Hand Pumps

Blackmer Pump Co., Grand Rapids, Mich.

Hand Punches

Whitney Mfg. Co., W. A., Rockford, Ill.

Hand Saws, Portable Electric

Skillsway, Inc., 3304 Elston Av., Chicago, Ill.

Hand Screw Machines, Precision

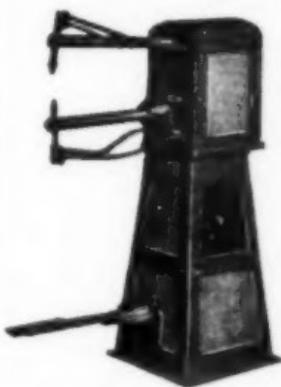
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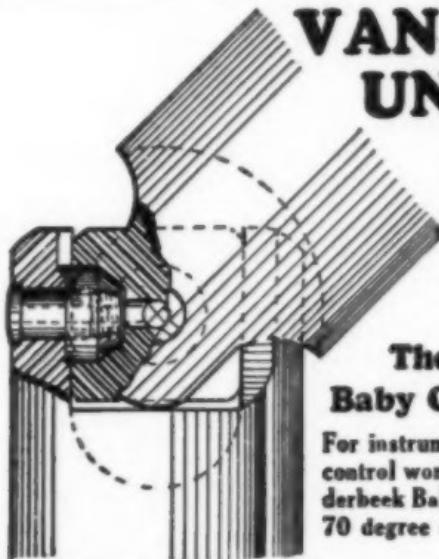
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- Hollow Adjustable Mills**
Gairing Tool Co., Detroit, Mich.
- Hydraulic Valves**
Galland-Hennings Mfg. Co., Milwaukee, Wis.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
- Index Centers**
Brown & Sharpe Mfg. Co., Providence, R. I.
Wm. Carroll & Son, Norwood, Cincinnati, O.
- Indicating Dials**
Federal Products Corp., Providence, R. I.
- Indicators, Speed**
Groves Tweed & Co., 109 Duane St., New York, N. Y.
- Indicators, Surface Test**
Reich Mfg. Co., J. H., Dayton, Ohio
- Jigs and Fixtures**
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mfg. Co., Hartford, Conn.
Sleek Tool Co., Ferndale, Mich.
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- Knife Grinders**
Rogers & Co., Samuel G., Buffalo, N. Y.
- Knurls and Holders, for Turrets**
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- Lathe Centers**
Modern Mfg. Corp., Brooklyn, N. Y.
Rigid Tool Holder Co., Detroit, Mich.
- Lathe Drives**
Culman Wheel Co., 1850 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.
- Lathe, Automatic**
Jones & Lamson Mfg. Co., Springfield, Vt.
- Lathe, Bench**
Atlas Press Co., Kalamazoo, Mich.
Delta Mfg. Co., Milwaukee, Wis.
Hardinge Brothers, Inc., Elmira, N. Y.
Rivett-Lathes Grinder Inc., Brighton, Boston
Sheldon Machine Co., 3256 Cottage Grove Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.
- Lathe, Back Geared**
Rivett Lathe & Grinder, Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.
- Lathe, Brake Drum**
South Bend Lathe Works, South Bend, Ind.
- Lathe, Engine**
South Bend Lathe Works, South Bend, Ind.
- Lathe, Gap Bed**
South Bend Lathe Works, South Bend, Ind.
- Lathe, Polishing and Buffing**
Hammond Machinery Builders, Kalamazoo, Mich.
- Lathe, Precision Bench**
Hardinge Brothers, Inc., Elmira, N. Y.
South Bend Lathe Works, South Bend, Ind.
- Lathe, Precision Bench Screw**
Cutting
Hardinge Brothers, Inc., Elmira, N. Y.
South Bend Lathe Works, South Bend, Ind.
- Lathe, Screw Cutting**
South Bend Lathe Works, South Bend, Ind.
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Schauer Machine Co., Cincinnati, Ohio
- Lathes, Turret**
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- Layout Tables**
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- Leather Oil Retainers**
Chicago Rawhide Mfg. Co., 1300 Elston Av., Chicago, Ill.
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.
- Leather Pkg., Hydraulic & Pneumatic**
Chicago Rawhide Mfg. Co., 1300 Elston Av., Chicago, Ill.
- Live Lathe Centers**
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Sturdimate Tool Co., Detroit, Mich.
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Easson Brass Corp., Detroit, Mich.
Fauver J. N., Detroit, Mich.
Norgren, C. A., Denver, Colorado
- Lubricators, Automatic**
Fauver, J. N., Detroit, Mich.
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.
Groves Tweed & Co., 109 Duane St., New York, N. Y.
M. B. Products Co., Detroit, Mich.
Norgren Co., C. A., Denver, Colo.
- Mandrels, Expanding**
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.
- Marking Machines**
Schmidt, Geo. T., Inc., 1802 Belle Plain Ave., Chicago, Ill.
- Micrometers**
Micro Products Co., Detroit, Mich.
- Milling Attachments**
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Cincinnati, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.
Dales Tool Co., Syracuse, N. Y.
Master Machine & Tool Co., North Kansas City, Mo.
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Burke Machine Tool Co., Cincinnati, Ohio
Hardinge Brothers, Inc., Elmira, N. Y.
- Milling Machines, Precision Bench**
Brown & Sharpe Mfg. Co., Providence, R. I.
Hardinge Brothers, Inc., Elmira, N. Y.
- Milling Machines, Hand**
Burke Machine Tool Co., Cincinnati, Ohio
- Milling Machines, Plain**
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Cincinnati, Ohio
- Motors**
Chicago Electric Co., 1850 W. 22nd St., Chicago, Ill.
Janette Mfg. Co., 552 W. Monroe St., Chgo.
- Motors, Small Universal**
Speedway Mfg. Co., Cicero, Ill.
- Motor-Generator Sets**
Chicago Electric Co., 1850 W. 22nd St., Chicago, Ill.
Janette Mfg. Co., 552 W. Monroe St., Chgo.
- Motor Drives, Universal**
Culman Wheel Co., 1850 Altgeld St., Chgo.
Staeger Machinery Co., 18 S. Clinton St., Chicago, Ill.
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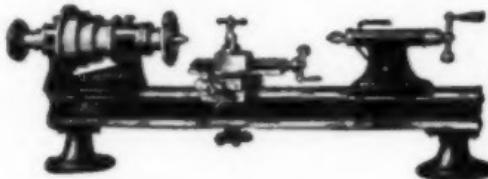
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Johnson Tool Co., East Providence, R. I.

Multiple Oilers

Gits Bros. Mfg. Co., 1880 S. Kilbourn, Chicago

Nibbling Machines

Lubert Machine Co., Green Bay, Wis.

Nat'l Machine Tool Co., Racine, Wis.

Nitrided Products

Universal Eng. Corp., Frankenton, Mich.

Numbering Machines

Numberall Stamp & Tool Co., Staten Island, N. Y.

Oil Cups

Kress Brass Corp., Detroit, Mich.

Gits Bros. Mfg. Co., 1880 S. Kilbourn, Chicago

Oil Gauges

Kress Brass Corp., Detroit, Mich.

Gits Bros. Mfg. Co., 1880 S. Kilbourn, Chicago

Oil and Grease Seals

Gits Bros. Mfg. Co., 1880 S. Kilbourn, Chicago

Operating Valves

Galland-Hennings Mfg. Co., Milwaukee, Wis.

Packing, Hydraulic

Chicago Rawhide Mfg. Co., 1290 Elston Av., Chicago, Ill.

Packings, Steam

Grimes Tread & Co., 100 Duane St., New York, N. Y.

Pins and Lacing for Belting

Chicago Rawhide Mfg. Co., 1290 Elston Av., Chicago, Ill.

Pins, Leader And Dowel

Arcne Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Baumbach Mfg. Co., E. A., 1812 no. Kildare Ave., Chicago

Pipe Cutters

Ridge Tool Co., Elvira, Ohio

Pipe Vises

Ridge Tool Co., Elvira, Ohio

Pipe Wrenches

Ridge Tool Co., Elvira, Ohio

Point Thinning Machines

Oliver Instrument Co., Adrian, Mich.

Press Brakes

Allsteel Press Co., 12015 S. Peoria St., Chicago

Dreis & Krump Mfg. Co., 7440 Leominster Blvd., Chicago, Ill.

Press Feed

Littell Machine Co., F. J., 4125 Ravenswood Ave., Chicago, Ill.

Wittak Mfg. Co., 4300 W. 54th Place, Chicago

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.

Fanno Machine Co., Racine, Wis.

Greenard Arbor Press Co., Nashua, N. H.

W. H. Nicholson & Co., Wilkes-Barre, Pa.

Shanklin Machine Co., 2825 Cottage Grove Ave., Chicago, Ill.

Wilson, E. R., Buffalo, N. Y.

Presses, Bench

Rockford Iron Works, Rockford, Ill.

Presses, Batching

Greenard Arbor Press Co., Nashua, N. H.

Presses, Foot

Rockford Iron Works, Rockford, Ill.

Famen Machine Co., Racine, Wis.

Presses, Forming

Marshall's Mfg. Co., Marshalltown, Ia.

Presses, High Speed

Super-Speed Press Corp., 55 Liberty St., New York, N. Y.

Presses, Inclinable

Federal Press Co., Elkhart, Indiana

Marshalltown Mfg. Co., Marshalltown, Ia.

Rockford Iron Works, Rockford, Ill.

Presses, Power

Allsteel Press Co., 12015 S. Peoria St., Chicago

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Federal Press Co., Elkhart, Indiana

Rockford Iron Works, Rockford, Ill.

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Dreis & Krump Mfg. Co., 7440 Leominster Blvd., Chicago

Henry & Wright Mfg. Co., Hartford, Conn.

Lewistown Mfg. Co., T. H., 211 R. 47th, N. Y.

Marshalltown Mfg. Co., Marshalltown, Ia.

Super-Speed Press Corp., 55 Liberty St., New York, N. Y.

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Pulleys, Die Cast

Conway-McCormick Co., Cincinnati, O.

Pulleys, Steel and Wood

Davis Mfg. Co., Milwaukee, Wis.

Pulleys, Vacuum Cup

Vacuum Cup Metal Pulley Co., Detroit

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Blackmar Pump Co., Grand Rapids, Mich.

Brown & Sharpe Mfg. Co., Providence, R. I.

Galland-Hennings Mfg. Co., Milwaukee, Wis.

Pumps, Coolant

Rutherford Machine Co., Cincinnati, Ohio

Towle-Eins-Johnson Co., Jackson, Mich.

Pumps, Lubricant

Rutherford Machinery Co., Cincinnati, Ohio

Punch, Shear and Bender, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Buffalo Forge Co., Buffalo, N. Y.

Punches and Dies

Whitney Mfg. Co., W. A., Rockford, Ill.

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Buffalo Forge Company, Buffalo, N. Y.

Lewistown Mfg. Co., T. H., 211 R. 47th, N. Y.

Whitner Metal Tool Co., Rockford, Ill.

Punches and Dies

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Pyrometer Instrument Co., 102-106 Lafayette St., New York City

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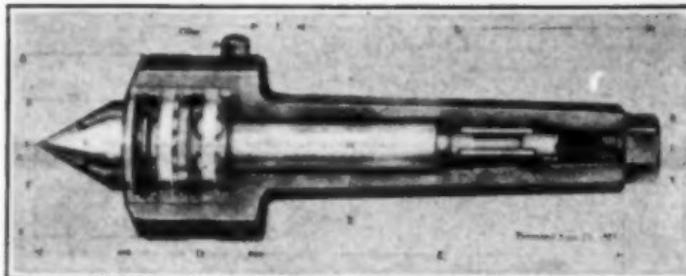
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- Riveters, Multiple Spindle**
Grant Mfg. & Mch. Co., Bridgeport, Conn.
- Riveters, Pneumatic**
Grant Mfg. & Mch. Co., Bridgeport, Conn.
- Riveting Machines**
Grant Mfg. & Mch. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.
Linley Bros. Co., Bridgeport, Conn.
- Riveting Machines, Tubular and Split**
Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.
- Hed Cutters**
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
- Lewthwaite Mch. Co., T. H., 811 E. 47th, N. Y.
- Router Bits**
Putnam Tool Co., Detroit, Mich.
- Sanders, $\frac{1}{2}$ Operated**
Sterling Products Co., Detroit, Mich.
- Sanders, Portable**
Sterling Products Co., Detroit, Mich.
- Saws, Electric Hand**
Deltas Mfg. Co., Milwaukee, Wis.
- Saw Sharpening Machines**
Rogers & Co., Samuel G., Buffalo, N. Y.
Wardwell Manufacturing Co., Cleveland, O.
- Sawing Machines**
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Weiss Mfg. Co., Three Rivers, Mich.
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- Screw Machine Tools**
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- Shafts, Steel**
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- Shapers**
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- Shaping Machines**
Osborne & Sexton Mch. Co., Columbus, O.
Western Mch. Tool Whs., Holland, Mich.
- Shears, Bevel**
Marshalltown Mfg. Co., Marshalltown, Ia.
- Shears, Hand**
Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Beverly Throatless Shear Co., 8007 W. 110th Place, Chicago, Ill.
Lewthwaite Machine Co., T. H., 811 E. 47th St., New York
The National Machine Tool Co., Racine, Wis.
Whitney Metal Tool Co., Rockford, Ill.
- Shears, Power**
Buffalo Forge Co., Buffalo, N. Y.
Drais & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Libert Machine Co., Green Bay, Wis.
- Shears, Slitting**
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Buffalo Forge Co., Buffalo, N. Y.
Drais & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
National Machine Tool Co., Racine, Wis.
- Shears, Splitting**
Marshalltown Mfg. Co., Marshalltown, Ia.
- Shears, Threadless**
Beverly Throatless Shear Co., 8007 W. 110th Place, Chicago, Ill.
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Libert Machine Co., Green Bay, Wis.
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- Sine Tables**
Robbins Engineering Co., Detroit, Mich.
- Special Tools and Machinery**
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- Speed Reducers**
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Armstrong Co., Milwaukee, Wis.
Chicago Gear Whs., 769 W. Jackson, Chgo.
Culman Wheel Co., 1350 Altgeld St., Chgo.
Janette Mfg. Co., 552 W. Monroe St., Chgo.
- Speed Saws, Universal**
Wyzenboek & Staff, Inc., 642 Washington Blvd., Chicago
- Spinning Lathes, Metal**
Oliver Machinery Co., Grand Rapids, Mich.
- Spools & Nuts for Auto. Screw Mch's.**
Sutton Tool Co., Detroit, Mich.
- Split Rivets**
Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.
- Split Rivet Setters, Automatic Feed**
Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.
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Miller Engineering Co., Inc., Newark, N. J.
Interstate Machinery Co., Chicago, Ill.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.
Taylor Winfield Corp., Detroit, Mich.
- Sprockets**
Culman Wheel Co., 1350 Altgeld St., Chgo.
- Stake Riveters**
Marshalltown Mfg. Co., Marshalltown, Ia.
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Hamilton Tool Co., Hamilton, Ohio
Wrought Wafer Mfg. Co., Milwaukee, Wis.
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Western Mfg. Tool Wks., Holland, Mich.

Tapping Attachments

Errington Mech. Lab., Staten Island, N. Y.
Ettos Tool Co., Brooklyn, N. Y.
Precious Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.
Western Mfg. Tool Wks., Holland, Mich.

Tapping Jigs, Universal

Hauser Mfg. Co., 1855 No. Paulina St., Chicago, Ill.

Tapping Machines and Attachments

Burke Machine Tool Co., Connecticut, Ohio
Clearmont Mfg. Tool Co., Green Bay, Wis.
Kitco Tool Co., 504 Johnson Av., Brooklyn, N. Y.
Precious Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type

Illinois Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Ill.

Threading Machines, Automatic

Grant Mfg. & Mch. Co., Bridgeport, Conn.
Jones & Lamson Mfg. Co., Springfield, Vt.
Riker-Shafer Co., Erie, Pa.

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Ridge Tool Co., Kyrin, Ohio.
Rivet Lathes & Grindelers, Brighton, Boston

Tool Heads, Universal

Precision Tool Co., Bridgeport, Conn.

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Michigan Tool Co., Detroit, Mich.
Migil Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tool Reclaiming

Machinists Tool Grinding & Mfg. Co., 3058 W. Van Buren, Chicago, Ill.

Tools

Vine Tool Co., Detroit, Mich.

Tools, Abrasive

White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Boring

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Gairing Tool Co., D'Iberville, Mich.

Tools, Lathes and Planer

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R.I.

Tools, Multi-Diameter

Gairing Tool Co., Detroit, Mich.

Transfer Punches

McMahon Co., Frank, Dayton, Ohio

Tube Fittings

Essex Brass Corp., Detroit, Mich.

Tube Flanging Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.

Tube Rivet Setters, Automatic Ed., Chicago Rivet & Machine Co., 1855 S. 54th St., Cicero P. O., Chicago, Ill.

Tungsten Carbide Tools

Michigan Tool Co., Detroit, Mich.

Turning Tools

Banner Mfg. Co., 1873 Clybourn Av., Chicago, Ill.
R & L Tools, Nicetown, Philadelphia, Pa.

Universal Drill Jigs

Hauser Mfg. Co., 1855 No. Paulina St., Chicago, Ill.

Universal Joints

American Tool Works, Inc., Hartford, Conn.
Apex Machine Co., Dayton, O.
Chicago Gear Works, 700 W. Jackson Blvd., Chicago

Used and Rebuilt Machinery

Auer Machinery Co., 176 Lafayette St., New York City

Alamo Engine Co., Hillsdale, Mich.

Balyea Co., Inc., 100 W. 18th St., New York, N. Y.

Bennet-Raskin Corp., 30 Church St., N. Y., N. Y.

Bernstein & Co., (see M. & B.), Clinton, Chicago

Bissell Mfg. & Mch. Co., Springfield, Ill.

Bradley Machinery Co., Detroit, Mich.

Brandt Mch. Sales, Pittsburgh, Pa.

Brown Machinery Co., St. Louis, Mo.

Brownell Machinery Co., Providence, R. I.

Burns Mch. Co., E. W., Milwaukee, Wis.

Cincinnati Mch. & Supply Co., Cincinnati, O.

Clinton Mch. Co., 33 S. Clinton St., Chicago

Dalitz, Harry, Cleveland, O.

Davis Machinery Co., Toledo, Ohio.

Dele Equipment Co., Philadelphia, Pa.

Eastern Machinery Co., Cincinnati, O.

Elyria Belting & Mch. Co., Elyria, O.

Emerson, Louis E. & Co., 1761 Elston Ave., Chicago, Ill.

Erie Electric Motor Repair, Inc., Buffalo, N. Y.

Essler Machinery Co., E. I., 325 Dear St., Chicago, Ill.

Falk Mill Supply Co., Inc., Rochester, N. Y.

Foster Machinery Co., Cleveland, Ohio.

General Blower Co., 401 N. Dearborn St., Chicago.

Gancey Machinery Co., Buffalo, N. Y.

Globe Mch. Co., 602 W. Lake St., Chicago.

Goldman, Harvey H., Detroit, Mich.

Hill, Clarke & Co., 646 W. Washington Blvd., Chicago, Ill.

Heathrow Mch. Co., Inc., C. C., Detroit, Mich.

Hyman & Sons, Joseph, Philadelphia, Pa.

Indianapolis Machinery & Supply Company, Indianapolis, Ind.

Industrial Mch. Co., Indianapolis, Ind.

International Machinery Co., Detroit, Mich.

Interstate Mch. Co., 109 S. Clinton, Chicago.

Iroquois Machinery Co., Buffalo, N. Y.

Jones & Sons Machinery Co., Wm. C., St. Louis, Mo.

Jones Machine Tool Co., Cincinnati, Ohio.

Jones Mch. Co., Royal Oak, Mich.

Kinney Co., E. A., Cincinnati, Ohio.

Land J. J., 145 Grand St., New York, N. Y.

Lang Machinery Co., Pittsburgh, Pa.

Larus, J. L., Bridgeport, Conn.

McDonald Machinery Co., St. Louis.

Machinery Dealers, Inc., New Haven, Conn.

Marr-Gallbreath Mch. Co., Pittsburgh, Pa.

Midwest Equipment Co., 830 W. Lake St., Chicago, Ill.

Miles Machinery Co., Saginaw, W. M., Mich.

Molitor Machinery Co., Charles L., 120 S. Clinton St., Chicago, Ill.

Morey & Co., 48 Mill St., Astoria, Long Island, N. Y.

Norton Machinery Co., Cleveland, Ohio.

Norton-Broadway Machinery Co., Cincinnati, Ohio.

O'Brien Machinery Co., Philadelphia.

Ohio Mch. & Supply Co., Cincinnati, Ohio.

Ott Machinery Sales Co., Detroit, Mich.

Oborne & Sexton Mch. Co., Columbus, O.

Paxman Brothers, 700 Washington Blvd., Chicago, Ill.

Prutton Mch. Co., D. H., Cleveland, Ohio.

Riallance Machinery Sales Co., Pittsburgh, Pa.

Rosenfeld Mch. Corp., 950 W. Lake, Chicago,

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from 2" to 5½" diameter
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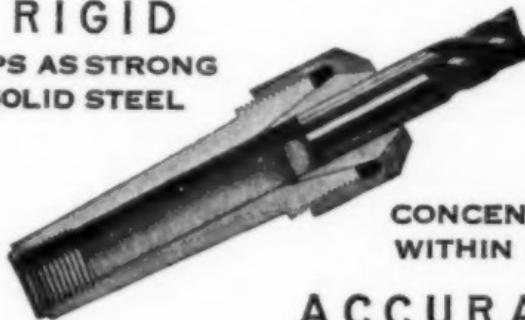
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Classified Finding Index

Used and Rebuilt Machinery—Cast.

Koenkran & Weisbecker, 2300 A Singer Bldg., New York City
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Segal Machinery Co., 117 S. Clinton St., Chicago, Ill.

Service Co., Cleveland, Ohio

Shank Mfg. Co., Bucyrus, O.

Simmons Machine Tool Corp., Albany, N.Y.

Standard Machine Co., Batavia, Ill.

Standard Mch. Co., Grand Rapids, Mich.

Strong, Carlisle & Hammond Co., Cleveland,

Sun Machinery Co., 28 Van Buren Street, Newark, N.J.

Surplus Stock & Mch. Co., Inc., 618 W. Lake St., Chicago, Ill.

Tamper Co., Milwaukee, Wis.

United Mch. & Supply Co., St. Louis, Mo.

Victor Machinery Co., 130 S. Clinton Street, Chicago, Ill.

Victor Machinery Exchange, 251 Centre St., New York, N.Y.

Vine, R. A., Detroit, Mich.

Wain Mch. Sales, Chas E., Detroit, Mich.

Waters Machinery Co., Elkhart, Ind.

Wertman Machinery Co., Cleveland, Ohio

West Penn Machinery Co., Pittsburgh, Pa.

White Mch. Co., A. D., 108 N. Jefferson St., Chicago

Wiggleworth Mch. Co., Cambridge, Mass.

Wolnick Machinery Sales, 9 S. Clinton St., Chicago, Ill.

Vacuum Cleaners, Portable

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Air

Ross Operating Valve Co., Detroit, Mich.

Valves

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Nicholson & Co., W. H., Wilkes-Barre, Pa.

Ross Operating Valve Co., Detroit, Mich.

Valves, Operating

Ross Operating Valve Co., Detroit, Mich.

Tomkins-Johnson Co., Jackson, Mich.

Vises, Combination Drill Table

Modern Machine Tool Co., Jackson, Mich.

Vises, Drilling Machines

Armstrong Bros. Mfg. Co., 341 N. Francisco Av., Chicago

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago

Desmond Stephan Mfg. Co., Urbana, O.

Husser Mfg. Co., 1628 No. Paulina St., Chicago, Ill.

Johnson Tool Co., East Providence, R.I.

Modern Machine Tool Co., Jackson, Mich.

Plunket Mch. Co., 1823 W. Lake St., Chgo.

Sheldon Machine Co., 2325 Cottage Grove Ave., Chicago, Ill.

Vises, Drill

Johnson Tool Co., East Providence, R.I.

Modern Machine Tool Co., Jackson, Mich.

Plunket Mch. Co., 1823 W. Lake St., Chgo.

Vises, Machinists'

Chicago Tool & Engr. Co., 5380 So. Chicago Ave., Chicago, Ill.

Desmond Stephan Mfg. Co., Urbana, O.

L-W Chuck Co., Toledo, Ohio

Martin Tool & Die Works, J. E., Springfield, O.

Modern Machine Tool Co., Jackson, Mich.

National Machine Tool Co., Racine, Wis.

Odin Universal Corp., 110 S. Dearborn, Chgo.

Sheldon Machine Co., 2325 Cottage Grove Ave., Chicago, Ill.

Western Tool & Mfg. Co., Springfield, O.

Vises, Milling Machine

Graham Manufacturing Co., Providence, R.I.

Hartford Special Mch. Co., Hartford, Conn.

L-W Chuck Co., Toledo, Ohio

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Plunket Mch. Co., 1823 W. Lake St., Chgo.

Sheldon Machine Co., 2325 Cottage Grove Ave., Chicago, Ill.

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Odin Universal Corp., 110 S. Dearborn, Chgo.

Vises, Shaper

Graham Manufacturing Co., Providence, R.I.

L-W Chuck Co., Toledo, Ohio

Odin Universal Corp., 110 S. Dearborn, Chgo.

Plunket Mch. Co., 1823 W. Lake St., Chgo.

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Modern Machine Tool Co., Jackson, Mich.

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Wrought Washer Co., Milwaukee, Wis.

Welders, Arc

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Lincoln Electric Co., Cleveland, Ohio

Welders, Portable

Robert Brothers, Troy, Ohio

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Welders' Glass

Faulk, F. R., 405 Penn Av., Pittsburgh, Pa.

Welding Accessories

The Lincoln Electric Co., Cleveland, O.

Welding Electrodes and Holders

The Lincoln Electric Co., Cleveland, O.

Welding Generators, Arc

The Lincoln Electric Co., Cleveland, O.

Welding Gages

The Lincoln Electric Co., Cleveland, O.

Welding Lens, Arc

The Lincoln Electric Co., Cleveland, O.

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The Lincoln Electric Co., Cleveland, O.

Welding Machines, Resistance

Armagle Co., Milwaukee, Wis.

Hudson Engineering Co., Inc., Newark, N.J.

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Pier Equip. Mfg. Co., Benton Harbor, Mich.

Wheels, Grinding

Chicago Wheel & Mfg. Co., M. C. Tool Div.,

1161 W. Monroe St., Chicago, Ill.

Woodworking Machinery

Tanowitz Works, Grand Rapids, Mich.

Worm Drives

Michigan Tool Co., Detroit, Mich.

Worm Gear Motor Units

Star Mch. & Eng. Co., Bloomfield, N.J.

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Greene Tweed & Co., 100 Duane St.,

New York, N.Y.

GRANT NOISELESS RIVETERS

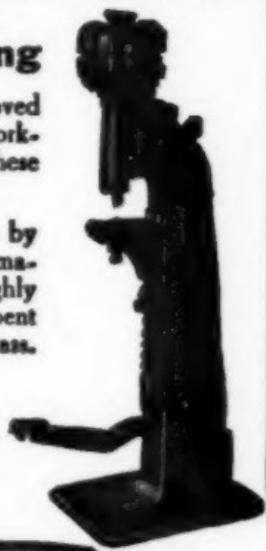
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For 35 years Grant rivet spinners have proved in daily use that the design, strength, workmanship and quality of material of these machines is unsurpassed by other riveters.

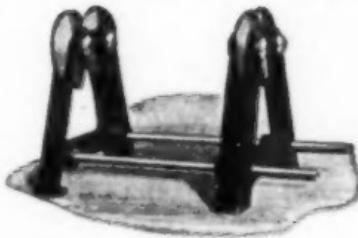
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Four Chilled iron discs rotate on sensitive special bearings.

No Leveling Required

A simple and excellent device for balancing straightening and truing.

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Swing	Greatest Distance Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000

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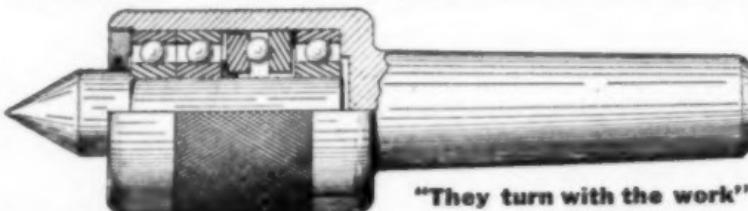
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Accuracy—Prompt Service

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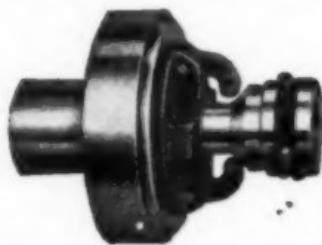


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DISC TYPE



The Carroll single plate disc type clutch was adopted by us in 1913. The disc type clutch today is by far the most popular type. Modernize your countershaft. It will cost you little for this lasting service. Write today

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Used and Rebuilt Machinery Section

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of 60 cents a line across the page, each issue, plus \$3.00 for name and address. Minimum charge, \$6.00. No display permitted.

Write directly to those offering the machines for sale, for prices and full descriptions. If what you seek is not advertised, use the enclosed printed form to make known your wants in either new or used machinery and the publisher will gladly pass them along to the advertisers.

FOR SALE BY

J. Bissell Mfg. & Machy. Co., 16th & Madison St., Springfield, Ill.

Boring mill, King 32" q. c., m. d., 5 hole turret, Lot 16 No. 64, like new.....	\$1900.	Jig, Wilson babbitt & align. Lathe 36"x18" L. & S. arr. m.d. Radial drill, 7' Bement. Trip hammer, 180 lb Champion. Valve refacer, B. & D. univ. m. d.
Hydraulic accumulator, approx. 3000 cu. in.		

FOR SALE BY

Aaron Machinery Co., 176 Lafayette Street, New York, N. Y.

Bolt threaders, 3 Acme. Engraving, mach., Gorton, all sizes. Grinder, P. & W. vertical, 14". Grinder, plain, cyl., Landis 20x72". Lathe, 26x48x23' McCabe, 2 spindle. Lathe, 19x12' Sidney, q. c.	Miller, No. 4 Cincinnati, bds., vert. Miller, No. 2, Rockford vert. Miller, Becker vert., m. d.....\$475. Pipe machine, 3" Jarecki. Shaper, American 16". Shaper, slotter, Rhodes, rotarytbl.
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FOR SALE BY

H. F. Wolnick Machinery Co., - 9 So. Clinton St., Chicago, Ill.

Air compressor, 225 cu.ft., d.c. motor, complete. Drill, Aurora 24" geared. Drill, Kern 4 spindl. No. 2T, tap. att. Gear hobsers, Schuchardt & Schutte. Grinder, disc, stationary & tilt. table. Lathe, Hendey 18"x8", t. a., o. p.,	r. a., rebuilt. Mill, LeBlond No. 3 plain. Mills, Cincinnati B & S. No. 4 pl., spd. Screw machines, auto., Gridley and Acme. Screw machines, W. & S. h. d., Nos. 3, 4, 6; also Bardons & Oliver.
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FOR SALE BY

Rosenfeld Machinery Corporation, 950 W. Lake St., Chicago, Ill.

Boring mill, 36" Bullard, m. d. Broaching machine, 3B LaPointe. Gear hobsers, No. 12 Barber-C., (2). Hack saws, Nos. 1 and 2 Marvel. Hack saw, Racine 6x6.	Lathe, Rockford 18x8 q. c. Mill, model c. s., Becker vert. a.p.d. Shear, 8' Kuchard foot power. Stacking machine, Economy 1000 lb. Turret lathes, Potter & J. model 6A.
--	---

FOR SALE BY

Globe Machinery Company - 602 W. Lake St., - Chicago, Ill.

Shear, Niagara 8' 16 ga. foot power, with gauges.....	\$250.
Air comp. 5x5 Chicago Pneumatic, 7½ h. p., a. c. motor, starter and tank.....	\$250.
Lathes, Oliver 16x8, q. c., com. - 575. Bridgeford, h. d. 28"x12", q. c. 785.	
	L. & S. 24"x12", q. c. complete 675. No. 6 W. & S. 28" opening... 585. Milling mach. No. 3 Cincinnati 675. Shaper, 28" Smith & Mills. Send us your inquiries.

USED AND REBUILT MACHINERY

FOR SALE BY

Scott-Bansbach Machinery Co., 4607 West 20th St., Chicago, Ill.

Automatic screw machines, B. & S., Nos. 90, 0, 2.....	\$350 to 1000.
Automatic screw machine, B. & S. No. 19 high speed, cap. $\frac{3}{8}$ " x $\frac{1}{2}$ ", b. d.	350.
Automatic screw machine, B. & S. No. 19 high speed, with motor.....	500.
Automatic screw machine, Cone, 1", 4 spdl, b. d.	1250.
Automatic screw machine, Davenport, $\frac{1}{2}$ ", 5 spindle, b. d.	750.
Automatic screw machine, Gridley 4 spdl. Model F 24"	1000.
Automatic screw machine, Gridley, 4 spdl, $\frac{1}{2}$ ", Model G. and F	600.
Automatic screw mch., Cleveland, $\frac{1}{2}$ " to $\frac{1}{2}$ ", model A and B....	\$150 to 450.
Automatic screw machine, Cleveland model "B", 2" cap., belt drive.	300.
Air compressor, Curtis, 8" x 8", capacity 80 to 110 cu. ft.	275.
Air compressor, Chicago Pneumatic, 10" x 8", capacity 117 cu. ft.	250.
Buffer, 5 H. P. Hill Curtis, rite speed, tex rope drive.....	300.
Broach, Hercules Power, 15 ton, motor drive.....	400.
Drill, New Albany, h. s., motor drive, 110-40-1.....	100.
Drill, Leland Gifford, h. s., b.b. sensitive, $\frac{1}{2}$ " capacity.....	75.
Drill, Demco h. s., b. b., $\frac{1}{2}$ " capacity.....	110.
Drill, 2 spindle Leland-Gifford h. s., b. b., sensitive, $\frac{1}{2}$ " cap.	150.
Drill, 2 spindle Leland-Gifford h. s., b. b., 14", No. 2 M. T.	250.
Drill, 3 spindle Avey, h. s., b. b. bench type on pedestal, $\frac{1}{2}$ " cap.	200.
Drill, 3 spdl., Leland-G., 24" swing, h. s., b. b., 12" travel, 26"x54" tbi.	500.
Drill, 4 spindle Demco h. s., b. b., 16" swing, $\frac{1}{2}$ " capacity.....	400.
Drill, 6 spindle, Avey, No. 4, H.S.B.B., belt drive.....	600.
Drill, 20" Canedy-Otto, back geared, power feed.....	100.
Drill, No. 24, 24" Foot-Burt, heavy duty with tapping attachment	500.
Drill, gang, 3 spindle Barnes, 22" swing b. g., p. f., No. 4, m. t.	275.
Drill, 21" Kokomo, hi-speed, sliding head, back geared power feed.	275.
Drill, 24" Cincinnati-Bickford sliding head, back geared, power feed.	300.
Drill, 32" Mechanics, sliding head, back geared, power feed.....	350.
Drill radial, 24" Carlton plain, No. 4 Morse taper.....	350.
Drill, radial, 3 ft., Wisconsin, high speed, sensitive, $\frac{1}{2}$ " capacity.....	200.
Filing machine, No. 3 Bary, floor type, belt drive.....	100.
Gasoline engine, 10 h. p. Gray, automatic start.....	125.
Grinder, gear cutter, No. 23 Brown & Sharpe, 8" capacity.....	300.
Gear cutter, B. & S. No. 3, 26" for spur gears.....	300.
Gear hobber, No. 90 Pfauter, cap. 8" x 6" x 10 DP.....	100.
Grinder, 6" x 32" Norton plain motor drive with motor.....	1000.
Grinder, 8" x 20" Fitchburg, takes 17" automatic feeds, b. d.....	400.
Grinder, 10" x 30", Frager, No. 2, Universal, self contained ctrshift.....	500.
Grinder, surface, No. 2 B. & S. with mag. chuck, cap. 18" x 6" x 9".....	550.
Grinder, surface, No. 2 Diamond, cap. 10" x 24", magnetic chuck, b.d.	600.
Grinder, Safety, surface, capacity 16" wide, 50" long, 12" high, belt dr.	500.
Grinder, Head, No. 65, cylinder, 16" spindle and fixture.....	350.
Hammer, No. 14B, High Speed, motor shelf, $\frac{1}{2}$ " capacity.....	100.
Hammer, No. 14B, High Speed motor shelf, $\frac{1}{2}$ " capacity 12" gap	125.
Hammer, No. 3-A h. d., $\frac{1}{2}$ " cap. with motor.....	200.
Hammer, No. 4 A, High Speed belt drive, $\frac{1}{2}$ " cap.....	200.
Hammer, No. 5A High Speed, motor shelf, $\frac{1}{2}$ capacity.....	275.
Hammer, Bradley, 30 lb. compact belt drive.....	200.
Hammer, Bradley, 40 lb. rubber cushioned helve, belt drive.....	325.
Hammer, Bradley, 50 lb., upright strap, belt drive.....	400.
Hammer, Bradley, 60 lb., rubber cushioned strap, belt drive.....	500.
Lathe, Stark bench, 7" x 30" x $\frac{1}{2}$ " cap., c. r., s. r., c. s. and chuck.....	300.
Lathe, 13" x 5" Monarch q. c., s. b. g. 4 jaw chuck taper att. rebuilt.....	200.
Lathe, 13" x 5" Willard, semi q. c., d. b. g.....	200.
Lathe, 13" x 6" South Bend, standard change gears.....	200.
Lathe, 14" x 6" Worcester semi q. c., with 4 jaw chuck.....	each 175.
Lathe, 14" x 6" LeBlond, q. c., D. B. G. 4 jaw chuck, 16" swing.....	350.
Lathe, 15" x 5" South Bend, standard change gears.....	250.
Lathe, 15" x 6" Springfield, q. c., b. g., taper attachment.....	325.
Lathe, 16" x 8" Hendey, q. c., s. b. g., 3 and 4 jaw chucks.....	650.
Lathe, 17" x 8" Cincinnati, semi q. c., d. b. g., with chuck.....	275.
Lathe, 18" x 8" Davis, d. b. g., q. c., heavy duty.....	450.
Lathe, 18" x 8" Walcott, q. c., d. b. g., taper att., 4 jaw chuck.....	650.
Lathe, 20" x 8" Walcott, q. c., d. b. g.	550.

USED AND REBUILT MACHINERY

Scott-Bansbach Machinery Co.—Continued

Lathe, 20"x8' Prentice, plain change with 2 chucks.	150.
Lathe, 24"x12' Dietz, Schumacher & Boye, plain change, with chuck.	300.
Lathe, 30"x13' H. S. & G. heavy duty, q. c., d. b. g. 16,000 lbs.	800.
Lathe, 18"x5' spinning, Grabo, 24" between centers.	175.
Lathe, 22"x44" spinning gap, Prybil, 40"-76" between centers.	400.

FOR SALE BY

Chas. E. Wain Machinery Sales,

Grinder, No. 1 Cin. T&C \$ 75.
Grinder, 40" Knife..... 190.
Grinder, No. 11 B&S..... 225.
Tapper, No. 2 Garvin..... 150.

7800 Mack Ave., Detroit, Mich.

Reaming mach. Footbur.	100.
Pipe threader, 2" Merrill.	85.
Pumps for every service.	
Collets—many sizes.	

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Joseph Hyman & Sons, - Tioga & Almond Sts., Philadelphia, Pa.

POWER PRESS SPECIALISTS

407A & 405B Bliss toggles, tie rod.
150 ton E52 Ferracute embossing.
No. 34B Bliss toggle.
No. 205E Toledo, dbl. crank, gap.

No. 79B Bliss, 16" stroke tie rod.	
No. D201 Ferracute tie rod.	
Shuster straight & cut off 8"x14".	
Hundredsof presses of various types.	

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Bolt cutter, 1" Landis dbl. hd. lead screws.
Gear hobbers, No. 12 B.-C. double overarm, m. d.
Grinder, Capitol internal.
Grinder, No. 75 Heald internal.
Grinder, Bath, universal, attach.
Keyseater, No. 2 Mitts & Merrill.
Lathe, 2"x36" Jones & L. flat turret.
Mill, No. 3 Kempsmith plain.
Mill, No. 2A Garvin univ. compl.
Mill, model C Becker vertical.

Mill, No. 4 LeBlond universal complete, m. d.	
Nibbler, 6" Campbelli metal.	
Planer, 36"x36"x8" American, 2 hds.	
Press, No. 53 Toledo, s. s.	
Radial drill, 3" Bickford, motor dr.	
Screw machine, No. 3 Foster hand.	
Screw machine, 14" Gridley model F.	
Shaper, 20" Ohio crank, b. g.	
Shear, 205 P.S. & W. circle&flanging.	
Threaders, 4" Geometric.	

FOR SALE BY

International Machinery Co., 3178 Bellevue Ave., Detroit, Mich.

Automatic, 8"-1 1/16", 4 sp. Cleveland model M, m. d.
Automatic, Gridley 4-sp. auto., 14", model F, multiple spindle.
Boeing mill, 42" Gisholt.
Drill, radial, 24" American, gear box.
Drills, 21", 24", 29" Cincinnati.
Drill, 32" Reed-Prentice, t. a.
Drills, Hyspeed, 1,2,3, 4-spindle.
Drill, No. 242 Barnes Camel Back, m. d.
Drill, No. 3 Leland-G., single sp., m. d.
Drills, Natco mult., all sizes, hyd. & mech.
Forming rolls No. H-1220 Voder, m. d.
Gear hob, 5-5AC Lees-Bradner m. d.
Gear cutters 4"x36" B. & S. (2).

Grinder, 84" Diamond face, m. d.	
Grinder, No. 22 Heald Rotary, 14" magnetic chuck, m. d.	
Grinders, No. 11 B&S plain, m. d. (2).	
Grinder, No. 70A Heald internal, duplex.	
Lathes, turret, No. 4, 6, W. & S.	
Miller, No. 1 Kent-Owens hand, m. d.	
Miller, 18" Cincinnati automatic.	
Miller, 24" Cincinnati duplex, m. d.	
Press, No. 36 Niagara, m. d.	
Shapers, 16" and 24" G. & E., m. d.	
Slotter 6" Pratt & Whitney Vertical m. d.	
Squaring shear, No. 196 Niagara, 8" 18 ga.	
Thread miller, 6" x 60" Hanson Whitney, m. d.	

USED AND REBUILT MACHINERY

FOR SALE BY

Marr-Galbreath Machinery Co.,

Air compressor, 4 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ " Gardner, water-cooled.
 Air compr., 7x5" Ing.-Rand, ER-1.
 Air comp., 5x8" Chicago, NSB.
 Air comp., 10x8" Ing-Rand, ER-1.
 Bolt threader, 2 $\frac{1}{2}$ " Landis dbl., m. d.
 Boring mill, 42" Bullard, 1 swivel and 1 turret head, m. d.
 Boring mill, N-B-P., flr., 2 columns, 6" bars, with separate milling hd., motors 220-v. d.c.
 Boring mill, 30" Colburn, turret hd.
 Boring mill, 30" Bullard V T L, threading attachment.
 Brake, 4"x10 ga. Robinson, hand.
 Brake, 7"x18 ga. Robinson, hand.
 Brake, 8x22 ga. Double Truss hand.
 Brake lining, punch and riveting machine, m. d.
 Compr., cent. 75 h.p. G.E., 3/60/220.
 Crusher, No. 1 Williams Little G., b.d.
 Die miller, Thurston-Schott, 650 lbs., S.P.D.
 Die sinker, No. 3 P. & W., r.t.
 Drill, 24" Aurora, t. a., m. d.
 Drill, 28" Superior, b. g., power fd.
 Drill, No. 11-B, Natco, 16-sp., m. d.
 Drill, rad., 24" Fosdick & Holloway.
 Drill, radial, 3" Dresses, tapping att.
 Drill, radial, 3 $\frac{1}{2}$ " Canedy Otto.
 Drill Radial, 4" Dresses, gr. box m. d.
 Forging mch., 1 $\frac{1}{2}$ " Acme; 2 $\frac{1}{2}$ " Ajax.
 Grinder, 7 $\frac{1}{2}$ h. p., U.S. dbl. end, 3/60.
 Grinder, pl. 11 B. & S. 4x30" (cheap).
 Grinders, univ. tool & cutter, 1 & 1 $\frac{1}{2}$ Cincinnati.
 Grinders, univ. Bath 10"x36", mag. chuck 9x31".
 Grinder Universal, 16"x48" Cie. m. d.
 Grinder Disc, No. 2 Gardner, 20" wheels, m. d.
 Grinder, 12"x6" Hendey G.H., T.A., S.P.D.
 Hack saw, 6x6" and 9x9" Racine.
 Hammer, power, 80 lb. Boss, b. d.
 Hammer, power, 50 lb. Little Giant.
 Hammer, 100 lb. Mayer, power.
 Hammer, 200 lb. Beaudry, power.
 Hammer, 400 lb. Bliss board drop, b.d.
 Hammer, 800 lb. Erie SF steam or air.
 Hammer, 1000 lb. Chamber's st. drop.
 Hammer, atm. drop, 1500 lb. (nr. new).
 Hammer, Syntron Elec., 1/60/110.
 Hoist, chain, 4-ton triplex, Y. & T.
 Jointer, bench, 4" Wallace, m. d.
 Keyseater, No. 2 Catlin, cap. 2"x15".
 Keyseater, No. 3 Mitts & M., belt.
 Lathes, 9"x3"; 10"x4", plain change.
 Lathes, 16"x7" National, q.c.g., (3).
 Lathe, 20"x10" Johnson q. c. g., t. a., chuck.
 Lathe, 22"x12" Rahn-Larmon, q.c.g.
 Lathe, 24"x8" L. & S., q.c.g., d.b.g., chuck.

55 Water St., Pittsburgh, Pa.

Lathe, 26"x14" Draper, plain change gear, chuck and c./s.
 Lathes, 42"x30" Bridge'd g. h., m.d.
 Lathe, turret, No. 4 W. & S., bar feed, m. d., g. f. h. (2).
 Miller, bench, No. 1 P. & W., hand. (like new).
 Miller, No. 2 Brown & S. pl. cone.
 Miller, pl., No. 15 Garvin, 42x10x21".
 Miller, No. 4 Ohio, table 101".
 Pipe cutter, 3" Murchey, motor 3/60/440 v.
 Pipe machine, 2" Robbins, bench, motor 1/60.
 Pipe machine, 12" Cox., b. d.
 Pipe machine, 12" E. C. & B., s. p. d.
 Pipe machine, 18" Wieland, m. d.
 Planer, 16"x16"x4" P. & W., 1-head.
 Planer, Gray, 56x48x10", 4 heads
 Polishing stand, 3 H.P. U.S., 3/60/220.
 Press, No. 78 $\frac{1}{2}$ Bliss T. R., 16" str.
 Press, Farrel D. C. bed 34x36" wgt. 13,700 lbs.
 Press, P-3 Ferracute m. d. (3)
 Press or shear, United ob., 3 $\frac{1}{2}$ " shaft, m. d. (2)
 Press, Horn., No. 160 Stoll, 2 $\frac{1}{2}$ " str. 1450 lbs.
 Press, 30-ton Lourie hydraulic.
 Pump, tripl., 14"x4" Worthington, b.d.
 Punch, triple combination Pels 16., m. d.
 Punch & shear, 25x24 U. Buffalo,
 Punch & shear, s.e., 4" x 4", 18" throat.
 Punch and shear, No. 3 L. & A., 4" x 4", 14" throat.
 Punch and shear, No. 12 Badger combined, b. d.
 Punch & sh. hand, No. 3B. Beloit 5/16"x4".
 Punch, s. e. rapid, No. 900 H. & J., 16" throat.
 Riveter, 4-A, high spd., belt, or m.d.
 Riveters, Shuster, 3" & 3/16", belted
 Riveter, No. 120 Grant, cap. 3", m.d.
 Saw, No. 10 Racine 9x9", belted.
 Saw, cold, No. 7 Espen-L., 18" belt.
 Saw, cold, No. 1 Newton, 44" belt.
 Saw, hack, No. 4 Marvel, m. d.
 Saw, No. 1 Marvel hack, 4"x4", b.d.
 Saw, 6"x8" Racine hack, gear box, belt drive.
 Shaper, 24" American b.g. crk., b.d.
 Shapers, 16", 20" & 24", G & E, cone.
 Shaper, 24" G. & E. hi-duty, motor 220-volt, d. c.
 Shaper, 15" Springfield, sbg; belt.
 Shaper, 15" Blount, friction type.
 Shapers, 14" Hendey, for m. d.
 Shaper, 20" G. & E. b.g., m. d.
 Shaper, 21" Smith & Mills.
 Shaper, 24" Barker b. g. V-ram, b.d.
 Shaper, 28" Hendey friction vise.
 Shear, angle, 6x14" Kling., m. d.

USED AND REBUILT MACHINERY

Marr-Galbreath Machinery Co. -Continued

Shear, throatless 18-M Marshalltown, motor drive.
Shear, bar 3" United, 24" blade, m.d.
Steam turbines, 100 h. p. 900 rev (2).
Straightener, 1" x 20' Shuster, cut-off.
Turret lathe, 18" x 34" Libby, m. d.

Valve refacer, Kwik-Way, cabinet base, m. d.
Weider, Arc 300 amp. 3/60/220.
Welders, arc, 35 amp., transformer.
Welding & cutting generator, Carbic
Wheel press, 60 ton 34" x 84", b. d.

Partial List. Get Our New Complete Stock List.

FOR SALE BY

Shunk Manufacturing Company

Brinell test, mch., Steel City, style A
Butt welder, Toledo, cap. 16" round.
Cylinder borer mch. Beaman & S. hor.
Drill press, Moline hole hog, 4 spdl.
Gas engine Miller, 85 h. p., 2 cyl.
Milling machines, Beaman & Smith,
continuous (2).

Auto Ave. - Bucyrus, Ohio

Motor generator set, Lincoln, synch.
Lathe, engine, Reid.
Planer, Gleason No. 2, 38" bet. col.
Pumps, blowers and fans, water and
air cooled engines.
Screw machine, Clev. aut., model A.
Steam engine, Skinner, 125 h. p.

FOR SALE BY

Service Co., - - -

Dual Arc 200 amp. with Continental
engine (1).
Rebuilt 200-amp. Westinghouse A.C.
stationary (3).
General Electric 200-amp., A.C. (2).
General Electric 400-amp., A. C. (3).
U. S. L. 200-amp. A.C. (1).
Lincoln 200 ampere with 6 cylinder
Packard engine (1).

3732 Cedar Ave., Cleveland, Ohio

WELDERS

Lincoln 300-amp., gas engine dr. (2).
Lincoln 200-amp., gas engine dr. (3).
Lincoln 400-amp., gas engine dr. (6).
Lincoln 300-amp., A.C., D.C. (2).
Transformer type A. C. welders,
220-440 volt (7).
Westinghouse 200 amp. with Con-
tinental engine (1).

We rebuild, buy and sell welders.

FOR SALE BY

Brown Machinery Co., - - -

Brake, Chicago Steel, 8' 18 gauge.
Drills, 14, 16, 20, 22, 24 & 42".
Drill, rail. Foote-Burt.
Drills, 16 & 20 spindle Natco.
Gear hobbers, G. & E. 12".
Grinders, cylinder, Madison, No. 68
Heald.
Grinders, cylindrical, 12" x 42" and
10" x 30" Landis, 14x72" Norton.
Grinders, disc. No. 6-20 Besly; No.
220 Badger automatic.
Hammers vert. 40 & 80 lb. Perfect.
Lathes, 25"x12" Putnam, taper att.;
18"x84" Ruhn-Mayer; 18"x8" L. &
S., pat. head; 16"x8" Bradford.
Millers, plain, No. 3 Kempsmith;
No. 2-B Milwaukee; 3½ Fox;
3-B Owen.
Millers, universal, No. 2 Hendey-
Norton; Lincoln type, No. 4
Hendey; slab, Briggs type No. II.
Presses, toggle, Nos. 167, 168 Tol.

2333 N. 9th St., St. Louis, Mo.

Planer, 26"x26"x6' Whitcomb.
Presses, toggle, Nos. 167, 168 Tol.
Presses, straight side, No. 73 Swaine;
No. 7 Zeh & Hahnemann, S. S.
SG81 Ferracute, grd., dbl. No. 35
Niagara.
Presses, o. b. i. Nos. 1, 2, 3, 4
Loshbough-Jordan; V & O No. 91.
Punches, sgl. end. Cleveland "C";
26" thr. 1 in 1"; Rock River Style
L rapid action, 24" thr. 1" in 1".
Punch & shears, dble. end, No. L-10
Badger 10" thr. 1 in 1".
Riveters, No. 5A High Speed 1" cap.;
Grant 1" 18" throat, M. D.
Saw, cold, Higley No. 14.
Screw machines., No. 2½ P. & W.;
1x15" P. & W.
Shapers, 16" Barker.
Shear, rotary bevel, 1" Lennox.
Shear, squaring, 10' Stark.
Welder, butt, Federal, 25 cy., 440 v.

USED AND REBUILT MACHINERY

FOR SALE BY

Ott Machinery Sales, Inc.,

Automatics, B. & S. Nos. 60, 6,
Cleveland Model A 1 $\frac{1}{2}$, 2 $\frac{1}{2}$,
& 4 $\frac{1}{2}$; Fay 14"x19"; Acme Nos.
53, 54, 55, and 78; Gridley
4 spdl. 3", 14", 18" & 24";
Boring mills, Bullard 52" 2 swivel
heads.

Drills, h. s., b. b. Henry & Wright
No. 2, 2, 4 and 6 spindle.

Drill, rad. Bickford 5'; Dreses 6'.

Gear shapers, Fellows Nos. 6.

Gear generators, Gleason 15" spiral
bevel; roughers and finishers;

Barber-Colman No. 3 and 12; Lees
Bradner No. 1.

Grinders, Brown & S. No. 11, s.p.d.
B. & S. Nos. 14 & 16 pl., m. d.
No. 2 B. & S., surface; B. & S.
Univ., No. 3; Heald No. 85, 60,

Many more good tools.

548 Second Ave., Detroit, Mich.

65, 70, & 75; Landis 10x36 plain
a. c., m. d.; American 14" x 6'
G.H.T.A.

Lathes, Hamilton G. H. 14"x6';
Hendey 18"x16" taper attachment
18"x8' Springfield, t. a.

Lathes, turret, J. & L. 2"x24" and
3"x28"; Warner & Swasey Nos. 2,
4 and 6, Steinle 24" 6 $\frac{1}{2}$ " hole.

Milling mch's., B. & S. No. 2 univ.
Kempsmith Nos. 12 & 33 Mig.;
Model B Becker vertical.

Presses, Ferracute P1, 2 and 3, and
D G 53; assorted o.b.i., s.s. single
and double crank, also toggle

Metalwood 30 ton hyd. Elmes
Hydraulic 300 ton.

Shaper, 20" & 24" Steptoe VRam, m.d.

Your inquiries solicited.

FOR SALE BY

Belyea Company, Inc.,

D. C. MOTORS

Adj. Speed—230 Volt

H. P.	MAKE	TYPE	SPEED
1—600	West.		400/600
1—400	G. E.	MPC	160/300
2—300	G. E.	MPC	300/600
1—125	G. E.	DMC	150/300
1—125	West.	SK 210	225 300
8—120	G. E.	DMC	300/750
2—80	Diehl	K11-40	550/1100
1—75	G. E.	CD	575/870
1—60	West.	SK	107/160
2—60	El. Dy.	25S	450/1200
5—60	El. Dy.	25S	525/1050
2—50	West.	SK-190	225/600
1—50	West.	SK-160	600/1200
12—40/50	Cr. Wh.	EM	175/700
1—40	West.		300/900
2—35	West.	SK	500/1500
1—30	El. Dy. BB.	10-S	800/1600
12—20	G. E.	LC	650/1950
2—7 $\frac{1}{2}$	G. E.	RF-10A	450/1800
12—7 $\frac{1}{2}$	West.	SK-80L	400/1600
12—7 $\frac{1}{2}$	West.	SK-70L	500/1500
14—5	West.	SK-70L	400/1600
10—3 $\frac{1}{2}$	West.	SK-40	450/1800

MOTOR GEN. SETS,

3—1250/1500 k. w. Westinghouse, 3
unit M. G. sets consisting of:
2—625/750 k. w. DC Gen. 125 v.,
600 RPM coupled on each end of:
1—1930 k. v. a. synch. motor, 2200
v. 600 rpm. 3 ph., 60 cy.

1—224 k. w. type SK, 125 v., 600
rpm. exciter.

1—1000 k. w., G. E. type M. P. C.,
D. C. Gen. 250 v., conn. to 1400
h. p. type ATI, synch. motor,
6600/2300 v., 514 r.p.m. 3 ph., 60 cy.

150 W. 18th St., New York, N. Y.

250 KW G E. 3 unit Synch. Motor
Gen. Set consisting of 2 125 KW
Interpole, DC, 125 V. generators
coupled on each end of 1—390 HP
Synch. Motor, 6600 V., 3 Ph., 25
Cy., 750 RPM.

2—250 KW G E. DC Gen., 250 v.
conn. to Synch. Motor, Type ATI,
2300 V., 720 RPM. 3 ph., 60 cy.

A. C. MOTORS—60 CYCLES

H.P.	TYPE	VOLTS	SPEED
1500	G.E. ATI	440/220	180
500	G. E.	440	1200
450	West.	440/220	257
375	G. E. ATI	600	2300
350	Cr. Wh.,	720	2500/440
225	E. Mchy. 3Brg	2300/4150	450
220	G. E. ATI	2300	900

SLIP RING TYPE

450	West. CW	2200	875/700
400	West. CW 1416	2200	290
400	G. E. MT424	4150/2300	390
400	West. CW	2200	514
300	Al. Ch ANY	2200	585
300	West. CW	1800	440/220
250	G. E. MT-424Y	4000/2300	257
250	F. Morse BV	2200	1200
250	West. CW	440/220	585
225	G. E.	440/220	1800
200	West. CW	440/220	575
200	West. CW	2200/550	870

SQUIRREL CAGE TYPE

1—250	West. CS	2300/440	580
1—200	G. E. JK	550	600
1—200	West. CS 876A	220/440	1160
1—100	G. E. IK15	440/220	720
1—100	West. Vert. CS	440/220	1200

USED AND REBUILT MACHINERY

FOR SALE BY

West Penn Machinery Company

1210 House Building,

Pittsburgh, Pa.

Air compressors, 30 to 2500 cu. ft.
Beader, Yoder, 13 ga. m. d.
Blower, No. 4 Roots, cap. 2110 c.f.m.
Bolt cutter, Acme 2", belt drive.
Bor. mills, 24" Bullard New Era.
Boring mill, 14", b. d.
Boring mill, 60" Colburn, 2 hds., spd.
Boring mill, 62" Betts, 2 heads, b. d.
Bor. mill, hor. 5" bar Barrett, m. d.
Brake, 7"x10 ga. D. & K. m. d.
Brakes, 3'x3/16" Chicago, m. d.
Bulldozers, Nos. 2, 4, 6, 9, 26, & 30.
Crane, 7½ ton Morgan, 65', 220v.DC.
Cranes, Electric Traveling.
Crane, crawler, gas., No. 2 No'vea.
Draw bench 20000 lb. W-F.
Drill, radial, 4' Prentice, t. a., b. d.
Drill, rad. 5' Cincinnati-Bick, m. d.
Drill, radial, 8' American, s. p. d.
Drill, rad. 6' Reed-Prentice, s. p. d.
Drill, mult. 26 sp. No. 30 Naco.
Drills, upright 10" to 36".
Drill, press, 6 spindle Allen.
Engine, gas, 20 h. p. Bessemer.
Flanger, McCabe, 4" capacity, dies.
Gear cutters, 11", 18" & 24" Gleason.
Gear tester, bevel 18" Gleason.
Grinder, roll, Farrel 28"x64".
Grinder, d. e. 2 h. p. 220/440/3/60.
Grinder, disc, No. 8—20" Besly, b. d.
Grinder, 12x24" Landis univ.
Grinder, sheet, Mattison.
Grinder, D. E., 3H P. 220/3/60.
Grinder, surface 8" Heald.
Grinder, sur. 14" Pratt & W., m. d.
Grinder, surf. Diamond, table 48x16".
Grinder, int. No. 60 Heald, b. d.
Hammer, 100 lb. Little Giant.
Hammer, Blacker, power, 35-lbs.
Hammer, Brad. 500 lb. upright.
Hammer, power, 90-lb. Justice, b. d.
Hammer, pwr., 100 lb. Brad. cush.
Hammers, Nos. 2-B, 3-B, 4B, Hazel.
Hammers, steam, 600 lb. to 6000 lbs.
Hammer, atm. dr., 1500 to 10000 lb.
Hogging machine No. 3 C. M. & M.
Lathe, 11"x5" Meyers, p. c. g., b. d.
Lathe, 14"x6" Prentice grd. hd.
Lathe, S-B 18x8", b. d.
Lathe, 18"x8", L. & S., b. d.
Lathe, 20"x10", Draper, b. d.
Lathe, 22"x12" R-L q.c.g., d.b.g.
Lathe, 24"x12" L. & S. b. d.
Lathe, 24"x15" Prentice, grd. hd.
Lathe, 42"x16" S. B., q.c.g., b. d.
Lathe, 42"x30" Bdgd. grd. hd.
Lathe, 60"x16" Putnam, b. d.
Lathe, spinning 32" b. d.
Lathe, roll, 18"x14".
Lathes, turret, No. 4 W & S. b. d.
Miller, vert. No. 6 Becker, m. d.
Miller, B. & S., Universal No. 4 b. d.
Motors, a. c. & d. c.

Nut tapper 8 sp. 1" National.
Pickler, 4 arm Mesta, 10' radius.
Pipe machine 2" Landis b. d.
Pipe inches., 6" Williams.
Planer, 42x42"x12' Cinc., 3 hds., b.d.
Press, No. 20C Bliss, OBI.
Press, No. 5 L. & J. OBI.
Press, No. 3 Bliss, Stiles type.
Press, cam, No. 69N Bliss, dbl act. inc.
Press, horn., No. 43 Toledo 14" str.
Press, No. 93-B Toledo, b. d.
Press, hyd. 100-ton Southwark.
Press, No. 55 Toledo, bed 20x19.
Press, No. 57 Toledo, 32"x32", str. 6".
Presses, hyd. 200-ton Oilgear.
Press, dbl. crank No. 5 Bliss, 2" str.
Press, o. b. i., Nos. 18, 19, 20 Bliss.
Press, screw, No. 87 Niagara.
Press, wheel, hyd., 300 ton Niles.
Press, 6 spindle, W-F.
Punch, beam, No. 5, H. & J.
Punch, Rock River, 4"-1".
Punch, E.F Cleveland, 36" thrt., 14"-1".
Pumps, Cent., 6", 4", 1", m. d.
Riveters, air, hammer, spinning.
Rolling mill, cold 9"x18".
Saws, frict on, Nos. 2, 3 & 4 Ryerson
Saw, cold, 48" Newton.
Saw, hack, Peerless, 4x4".
Saw, hack, Racine 6x6.
Saw, hack, Racine, 12x12.
Saw, hack, Peerless, 13"x15", m. d.
Scale, sheet bundling, 2500 lbs.
Shaper, 32" Cincinnati, b. d.
Shapers, 16", 20", 21" & 25" & E.
Shear, circle No. 3 Bliss, 40"x20 ga.
Shear, circle, Niagara, 4" cutters.
Shears, alligator, 14", 2", 3", 4" & 6".
Shear, angle 6x6x4", Cleveland.
Shear, bar 11", New Doty.
Shear, beam, 24" Cleveland.
Shear, bevel, Lennox 4", b. d.
Shear, comb, 24-U-Buffalo.
Shear, sq. 11"x10 ga. Niagara, m. d.
Shear, plate, 80"x4" Pels.
Shear, plate 66"x1" H. & J.
Shear, 120"x4" Lewis, m. d.
Shear, 186"x4", Lewis, m. d.
Straight'r, 48" Aetna-Sid 17 roll 31.
Shear, rotary 24" thrt. cap. 1", m. d.
Shear, Strein 10'-16 ga.
Shear, Buffalo all steel 3" sq., m. d.
Slotters, 6" Newton, 8" & 21" Betts.
Slotted, 24" Newton, motor drive.
Straightener, 42" Aetna std. 17' off 34".
Straightener, shape, Sutton No. 2.
Straightener, Shuster, 12"x4".
Straightener, 14", 4" rd. Abramson.
Tumbling barrel, 34"x45", b. d.
Upsetters, 1" to 6".
Welder, 40 kw. Thom. 2 pcs. 1".
Welder, butt 14" Winfield.

USED AND REBUILT MACHINERY

FOR SALE BY

E. L. Klauber Machinery Co.,
Centering machine, revolv. head.
Cyanide furnaces, No. 22 Stewart.
Filing machines, bench and floor.
Lathes, 18" 14" 18".
Hardening furnaces, No. 28 Stewart.

320-322 South Third St., St. Louis
Miller, Newton horizontal 16"x55".
Presses, No. 3&4 Crosby open back.
Saw, Racine 6x6 high speed, belt.
Screw machines, No. 2 Warner & S.
Shapers, 16"-20" Ohio sgl. pulley dr.

FOR SALE BY

General Blower Co. - - - - **401 N. Peoria St., Chicago, Ill.**

BLOWERS—FANS—EXHAUSTERS.

For Dust Collecting — Ventilating.
Oil and gas burners, cupolas, furnaces, etc.
Roots—Connersville and centrifugal blowers.

What are your blower requirements?

FOR SALE BY

Failey-Strafer Machinery Co.,
Bar shear, 6" sq.
Boring mill, 54" Colburn.
Conveyor and chain, 360', 4" links.
Grinder, No. 14 P.&W. surface b.b.
Grinder, 30"x96" Landis m. d.
Hammer, 1200 lb. Chambersburg b.d.

136 Liberty St., New York
Lathe, 3"x36" J. & L. bar & chuck'g.
Motor, 150 h. p. 900 rpm. 440-60-3.
Multi. punch No 5 H. & J. 7' 8".
Press, forging 1000 ton Mesta S-H.
Planer, Cin. 30"x20' 4H box table.
Sq. shear, 8"x14 ga. Geo. Ohl.

FOR SALE BY

United Machinery & Supply Co., **1241 Walton Ave., St. Louis, Mo.**
Brake, 5' D. & K. box and pan.
Brake, 10' 10 ga. D. & K., a.c., m.d.
Brake, D. & K. 8'x18 ga.
Grinder, No. 13 H. & S. universal.
Hammer, 50 lb. Beaudry.

Press, No. 37 Excelsior, 54" wide.
Presses, Toledo No. 167&168 toggle
drawing 50,000 lbs.
Punch, horizontal, H & J. 14". 4".
Rolls, corrugating, 6' Bertsch.

FOR SALE BY

Harry Dalitz, - - - - **701 E. 96th St., Cleveland, Ohio**
Automatic screw machines, Model B Cleveland, $\frac{1}{2}$ " to $\frac{3}{4}$ " (3).
Automatic screw machines, Model B Cleveland, $\frac{3}{4}$ " to $\frac{1}{2}$ " (2).
(Above machines single spindle, used only about 30 hours.)
Gear cutting mills, automatic, cut gears from $\frac{1}{2}$ " to 3" (7).
Lathe, turret, No. 4 Warner & Swasey; Pratt & Whitney.
Lathe, 16" Fulton metal turning, blocked up for 24".
Many other buys in high grade used machine tools.

FOR SALE BY

D. H. Prutton Mch. Co., **5295 W. 130th St., Cleveland, Ohio**
Automatic, Cleveland $\frac{3}{4}$ " model A.
Automatic, Cleveland $\frac{3}{4}$ " model A.
Chucker, $\frac{3}{4}$ " Cleveland model M
automatic.
Drills, $\frac{1}{2}$ " cap. Demco 4 spindle,
power feed, b. b. (3)
Gear hobbers, No. 0 and No. 1.

Schuchardt & Schutte.
Grinder, disc, No. 120 Gardner.
Pointers and threaders, $\frac{1}{2}$ " Economy
automatic. (4)
Press, No. 106 Bliss.
Press, cam drawing, No. 1 Bliss.
Presses, No. 4 & 5 Zeh & H. incl.

USED AND REBUILT MACHINERY

FOR SALE BY

The O'Brien Machinery Co.,

Band saw, 42" American, V-belt, m.d.
Boring mill, 24" Bullard New Era.
Boring mill, 100" N.B.P. mtr. dr.
103" swing, 82" under rail, rapid
traverse.
Boring mill, 24" Bullard, rap. prod.,
threading attachment.
Boring mill, 36" Bridgeport.
Crane, 36' Gantry, 20 ton, hand oper.
Davit, 6' Mueller radial, mtr. dr.
Drill, D2 Colburn, 3" cap.
Grinder, No. 103 Rivett, internal
hole cap, 1/64" to 2".
Grinder, 12"x24" Modern cylindrical.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. N.B.P. steam forg.
Hammer, 2000 lb. Chambersburg
double frame steam.

113 N. Third St., Philadelphia, Pa.

Lathe, 19"x8' Sidney, heavy duty,
belt dr. quick change.
Lathe, 30x24 New Haven, belt.
Miller, No. 3 LeBlond plain, belt
drive, table 12"x60", quick chge.
Miller, No. 3 Kempamith, plain,
table 10"x48", belt drive.
Miller, No. 5 Cincinnati plain, table
76"x19", s.p. drive.
Miller, Model D, Becker vertical
table 96"x20".
Pipe machines, 2, 4, 6, 8 and 12"
belt and motor drive.
Punch, No. 3 Royersford, double
end, 12" throat, cap. 1/2"x1 1/2".
Shapers, 14, 16, 20 & 24" various makes.
Turret, No. 1B Foster, S. P. drive.
2" capacity.

FOR SALE BY

Lang Machinery Company, 28th St. & A. V. R. R. Pittsburgh, Pa.

Air compr., 12"x10" Chicago, "nsb" m.d.
Automatics (4) No. 5-A Potter & J.
Blower, No. 5 Sturtevant, 8" dis.b.d.
Bor. mill, 24" Bullard, r. p. b. d.
Bor. mill, 30" Bullard, third.att., spd.
Bor. mill, 42" Gisholt, r.p.t., s.p.d.
Bor. mill, 54" Bullard, 2 hds. r. p. t.
Bor. Mill, 76" Bullard, 2 Hds. m.d.
Bor. mill, 84" Sellers, 2 hds. b. d.
Bor. mill, 10'-16' Betts, 2 hds. b. d.
Boring mill, hor. 3" Rockford, tbi.
Bolt cutter, 1" Landis, sgl. hd., b. d.
Bolt cutter, 1 1/2" Acme, sgl. hd., b. d.
Broach, No. 3 LaPointe, m. d.
Buffet, Marschke dbl. end, 220/3/60.
Drill, No. 1 24" Baker, cap. 2 1/2".
Drill, rad. 2' Fosdick, t. a., b. d.
Drill, radial, 2 1/2" Fosdick, s.p.d.
Drill, rad. 3' Bickford, t. a., b. d.
Drill, radial (2) 3" Cincinnati-Bick.
Drills, upright, 14" to 32".
Drill, sens. 3 sp. Reed, b. d.
Drill, 4 sp. No. 2 Foote-Burt, m. d.
Drill, 16-spdl. No. 12 Pratt & W.
Gear millers, No. 1 Bilton, b. d., (2).
Gear miller, Standard, 4 1/2"x4 1/2", b. d.
Grinders, single and double end.
Grinder, disc, dbl., 18" Diamond, b. d.
Grinder, plain, cyl. 10"x50" Norton.
Grinder, disc, No. 4 Gardner, 23" m. d.
Hammer, 100 lb. Bradley, cush. hel.
Hammer, forg. 5000-lb. Niles-B.P.
Hammers, st. drop 2000-6000 lb. Eric.
Keyseater, No. 4 Mitts & M. b. d.
Lathe, 14"x8" Carroll, q. c. g., b. d.
Lathe, 15"x6" American, q.c.g., b. d.
Lathe, 16"x12" Lodge & S. t. a. b. d.
Lathe, 20"x8" Lodge & Shipley, b. d.
Lathe, 24"x10" Bradford, p.c. g., b. d.
Lathe, 26"x12" Bridgeford, q.c.g., b. d.

Lathe, 30"x14" L. & S. q. c. g., m. d.
Lathe, 36"x12" Bridg. grd. hd., q.c.g.
Lathe, 38"x14" Boye & E. q.c.g., b. d.
Lathes, brass 18"x6" Amer, b. d., (2).
Lathes, tur. No. 4 W. & S. b. d.
Lineshafting - pulleys - hangers.
Miller, plain, No. 24 LeBlond, b. d.
Miller, plain No. 28 Ohio, table
11 1/2"x52", b. d.
Miller, plain No. 4 LeBlond, table
7 1/2"x16", b. d.
Miller, No. 24 B. & S. tbi. 17"x72".
Miller, univ. No. 24 B. Hendey-Nort.
Miller, slab, 36"x26"x12" Ing. adj. r.
Millers, vert. Nos. 4-8, 5-C&6 Becker.
Planer, 42"x42"x16" Cincinnati, m. d.
Planer, 42"x58"x10" Cin. 4 hds. m. d.
Planer, 50"x48"x14" N.-B.-P. 3 hds. b. d.
Press, No. 1-C standard, pedestal.
Press, embossing, 500-ton Am. b. d.
Press, No. 75 Toledo, open back 2" str.
Press, No. 57 Toledo, 6" stroke.
Punch, No. 5 H. & J. 62" th. 14"-18".
Saw, shaping, 13"x13" Peerless m. d.
Shaper, 28" Queen City, b. g., b. d.
Shaper, 24" Cincinnati, b. g., b. d.
Shaper, 26" Smith & Mills, b. d.
Shaper, 20" Cincinnati, b. g., b. d.
Shaper, 20" Steptoe, s. g., b. d.
Shear, Power, 36"x8" United, b. d.
Shear, plate, 10"x3/16" Niagara, m. d.
Shear, rotary No. 5-A Quickwork,
60"x12".
Shear, sq. 10"x8" Lewis, m. d.
Shear, sq. 18"x12" Lewis, m. d.
Tapping machine, 10" Baker, s.p.d.
Thread miller, No. 6 Lees-B. s.p.d.
Wiring & edging mch. No. 2 Magee.
Welders, arc, 200-300 amp Lincoln.
Unishear, No. 0 26"x16 ga., m. d.

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FOR SALE BY

Elyria Belting & Machinery Co.,

Crane, 10-ton Cleveland 44' span, with 3-ton auxiliary hoist, cab drive, 22 h. p. a. c. motors.
Drill press, Natco No. 11, arranged for 12 spindles.

Elyria, Ohio

Electric oven, Westinghouse 8' x 7' x 6' 8"
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Grinder, centerless, Heim No. 162.
Header, or upsetter, National, 34",
steel frame.

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Cleveland O.

Drill, multi. No. 2 Bausch, cap. 24 drills, head 17" x 32".
Hoist, 1/2 ton electric, 30' lift.
Riveter, 50 ton Hanna.
Rotary planer, 50" Cleveland, m. d.

FOR SALE BY

W. E. Brandt Mach'y. Sales,

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Bulldozer, No. 4 Williams & White.
Forging machines, 2", 3", 5" Nat'l.
Forging machines, 2 1/2" Ajax.

513 Empire Bldg., Pittsburgh, Pa.

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Keyseater, No. 2 Baker, 2" keyway.
Roll, bending 10' x 14" Cleveland.
Roll, bending, 8" x 8" H. & J. type.
Shear, 12' x 14 ga. Niagara (bargain).

FOR SALE BY

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Grinders, No. 2 B. & S. surface (4).
Hack saw, 8x8 Atkins.
Lathe, 16" x 8" Reed Prentice Toolroom (2).
Lathe, 14" x 6" Pratt & Whitney t. a.
Lathe, 14" x 6" Prentice g. h., q. c. g.
Lathe chucks, 10", 12", 28"

Miller, No. 2 Cincinnati universal.
Miller, 1" Kempsmith plain.
Miller, No. 24 Kempsmith univ. (4).
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Planer, 48" x 10' Liberty, like new.
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Miller, No. 3G Hendey universal.
Send for Complete Stock List.

Cambridge, Mass.

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rapid traverse.
Radial drill, 3' American, triple purp.
Saw, Avey Milband, 6" x 6" m. d.
Saws, Avey Milband, m. d.

FOR SALE BY

Brownell Machinery Co.,

Boring mill, vertical, King 40".
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Drill, No. 220 Baker with rotary job.
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Hammer, No. 8 Beaudry champion power.
Lathe, 32" x 28" New Haven.

150 Pine Street, Providence, R. I.

Lathe, 8" x 60" Lo-Swing..
Metal sawing machine, 6x6 Peerless.
Miller, No. 3 Hendey universal.
Miller, No. 2-M P. & J. automatic.
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Shaper, 20" G. & E. cone.

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Boring mills, Bullard Multi-Au-Matics, 6 spindles, 8" machines, 80% new (2).
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Gear hobber, 5A Lees-Bradner.
Grinder, chucking, No. 28 Bryant; new in 1931, used 6 months.
Lathe, 21" x 10' LeBlond, q. c. g., cone pulley, m. d.
Lathe, turret, No. 2 W. & S., bar fd. & collets, power feed to turret, cone pulley.
Mill, No. 2B heavy Brown & Sharpe plain, s. p. d.
Nibbler, Campbell No. 2, motor drive.
Press, No. 21 Bliss, o. b. i., 2 $\frac{1}{2}$ " stroke.

FOR SALE BY

Reliance Machinery Sales Company

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Air compressors, 90 and 342 cu. ft. Ing.
Brake, press, 72" Rob. toggle m. d.
Brake and folder, 72" Niagara,
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Drill, 4 spindle Colburn, Mfg. type,
cap. 2", like new.
Drill, 25" Prentiss, tapping att.
Hammer, 80 lb. Brad. cushion helve.
Hammer, 300 lb. Beaudry upright.
Lathe, 27" x 18" Pittsburgh, taper.
Lathes, spinning, 30" Bliss & Tol.,
roller bearing.

Pittsburgh, Pa.

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Nibbler, No. 1 Gray 34" tht., 3/16" capacity, m. d.
Press, No. 92-C Toledo, dbl. crank,
geared, 4" shaft 3" str.
Press, Robinson dbl. cr., 80" wide,
4" shaft, grd. 3" stroke.
Saw, hack, 12" x 12" Racine, m. d.
Shapers, 16", 20", 24", 25", 32", crk.
Shear, double angle, 6x8x3/4" Clev.,
mounted on turnable, m. d.
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motor end 3-60-220-v.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1211-1223 Hadley Street,

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Air compressors, 30' to 2000'.
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Bolt threader, 2 heads, Nat. 1".
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Boring mill, 42" Colburn, (2).
Boring mill, No. 0 Barret.
Boring mill, hor. 4 $\frac{1}{2}$ bar Betts
knee type.
Bulldozers, No. 3-4 and 8.
Drill, radial 3' American.
Drill, radial 3' Morris round column.
Drills, Colburn D4.
Drills, Baker 24".
Furnaces, various sizes.
Gear cutter, 60" G.E. spur.
Gear cutters, No 1&3 Adamshobbers
Grinder, No. 1 Wilmarth & M. univ.
Grinder, 12" x 72" Landis, m. d.
Grinders, 13x66 Landis universal.
Grinders, 16x66 Landis cyl. plain.
Hammers, 500 & 25 lb. Little Giant.
Hammer, 300 lb. Bradley.
Hammer, steam 4000 to 250 lb.
Hammer, 80 Perfect.
Keyseater, No. 2 M&M.
Lathes, turret, No. 3 & 7 universal
Bardons Oliver.

Lathe, 18" x 8' L. & S.
Lathes, 26" x 12 Flather, q. c. g.
Lathe, turret No. 6 Woods, tilted.
Lathe, turret, 24" Steinle.
Lathes, 3 Gridley 24", Model F., 4 sp.
Miller, Pratt & Whitney spline.
Miller, No. 4 Brown & S., plain.
Miller, No. 3 Hendey, plain.
Miller, Waltham thread.
Miller, No. 2 Kempsmith, univ.
Millers, No. 1 U. S. hand.
Millers, Ingersoll, 27" x 24" x 10'.
Planer, 36x30x8 Cleveland open side.
Planers, 60" x 48" x 10' Gray, 3 heads.
Planers, 24" x 24" x 6" Gray, 1 head.
Planers, 36" x 36" x 10" Cincinnati.
Press, No. 2-3 & 4 Marshalltown,
o. b. i., new.
Radial drill, 3'-4'-5'.
Saw, No. 14 Higley.
Saw, No. 2 Marvel.
Saws, 6x6 Acme.
Shaper, 18"-20"-24".
Shear, 3' Niagara, 16 ga.
Shears, 310 Niagara ring & circle 1/4"
Shears, 44" Bertsch sq., 16 ga.
1000 other tools available.

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Standard Machinery Co., 347 Indiana Ave., Grand Rapids, Mich.

Automatic, 14" Gridley Model F.
Boring mill, 42" Bullard vertical.
Boring mill, 34" Colburn vertical.
Boring mill, 24" Lucas horizontal.
Boring mill, 24" Binsse horizontal.
Drill, Baker 3" heavy duty.
Furnaces, Detroit Electric (4).

Lathes, 9" Porter-Cable Mfg.
Lathe, 2"x24" J. & L. flat turret.
Miller, model C-1 Becker hvy. vert.
Pipe machine, 8" Williams.
Presses, Waterbury Farrel S. S.
7" shaft, 30" between uprights (2).
Welder, No. 259A12T. Gibb Spot md.

FOR SALE BY

Jones Machinery Co., Royal Oak, Michigan

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Drill, No. 23 Foote-Burt, s. p. d.
Mill, No. 2 H. & S. plain, s. p. d.
Shaper, 24" Hollingsworth.
Welder, Projc. 175 KVA Thomson.
Welder, spot, 47 KVA Taylor.
Welder, seam, 50 KVA Gibb.

No. 15 Robinson horn press. (2)
No. 13 Niagara horn press.
No. 14 Niagara horn press.
No. P-2 Ferracute m. d.
No. P-3 Ferracute m. d.
No. P-13 Ferracute deep throat horn
No. 103 Cons'd d. c., o. b. i.

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Model M.
- Automatics, Cleveland, 4 spindle, 4".
Model M Chuckers.
- Automatics, No. 00 B. & S.
- Boring Mill, Cleveland, SPD 2½".
- Broach, American 12 ton Hyd. Vert.
Semi-Auto., M. D.
- Baldosser, No. 26 W. & W.
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- Grinder, Heim Centerless, M. D.
- Grinder, No. 72 Hyd. Int. Heald,
M. D. (3).
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- Grinders, No. 12A and No. 20 Bryant
Chucking.
- Grinder, No. 1 Wilmarth & M. Surf.
- Grinder, Heald, Duplex, Int.
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- Lathe, 18"x8" Hendey BMD.
- Lathe, 20"x8" Cisco TA.
- Lathe, 30"x10" Reed Prentice M. D.
- Lathe, Turret, No. 6 W. & S. Univ.
- Lathe, Turret, No. 5 Foster, Univ.
- Lathes, Tur., No. 9 B & O Univ. (2).
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- Mill, No. 3GH Hendey Univ.
- Mills, 18" and 24" Cin. Prod.
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- Presses, Nos. P2, P3, P4 Ferracute
M. D.
- Press, No. DG53 Ferracute (3).
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- Presses, 10 & 50 ton Henry & Wright
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- Press, No. 1018 Bliss Toggle.
- Press, No. 6D Bliss, dble. crank, Tie
Rod, 12" stroke, 19" sh. ht., 34" x
66" bol. Twin Drive.
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- Press, Cleveland, No. 44 Adj. Bed.
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PLANERS

- 36"x42"x10' Ingersoll Planer Type Milling Machine, m. d., 1 head on rail, 1 side head.
 48"x42"x8' Ingersoll Planer Type Slab Milling Machine, m. d.
 24"x Coulter Openside Crk. Planer, s.p.d.
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 36"x36"x12' Niles m. d., 4 heads.
 36"x16"x14' Liberty, m. d., 2 rail heads, 1 side head.
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 36"x11' American, 4 step.
 30"x20' American Geared Hd, 12 speed.
 30"x14' Lodge & Shipley Patent Head.
 30"x14' Lodge & Shipley, 5 step.
 30"x11' American, 5 step.
 27"x14' American, 3 step taper.
 25' raised to 32"x12' LeBlond, 3 step.
 24"x12' Schumacher-Boye, 3 step.
 24"x12' LeBlond, 5 step.
 24"x11' Chard, 4 step.

- 24"x10' Schumacher-Boye, 3 step.
 24"x10' Lodge & Shipley, d. c. mtr. dr.
 24"x10' Greaves-Kluman, 3 step.
 24"x10' Boye & Emmes, m. d.
 24"x8' Hendey Yoke Head.
 22"x10' L. & S., Selective Head, s.p.d.
 20"x12' Lodge & Shipley Patent Head.
 20"x10' LeBlond, 3 step.
 20"x10' Hendey Geared Head, m. d.
 20"x10' Hendey Yoke Head.
 20"x10' Boye & Emmes, 3 step.
 20"x10' American, 3 step.
 20"x8' American, 3 step.
 20"x6' Hendey Geared Head, m. d.
 20"x6' Hendey Yoke Head.
 18"x10' Reed-Prentice Geared Head, m. d., taper.
 18"x10' Lodge & S. Patent Head.
 18"x8' Lodge & Shipley Selective Head.
 18"x8' Greaves-Kluman, 3 step.
 16"x14' Lodge & Shipley Selective Head, m. d., taper.
 16"x12' Prentice Geared Head, m. d.
 16"x10' LeBlond, 3 step.
 16"x6' Hendey Geared Head, m. d.
 16"x6' Hendey Yoke Head, taper.
 14"x8' Reed-Prentice Geared Hd., m. d.
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 11"x4' South Bend, m. d.

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- No. 2M Cincinnati Vertical, Timken Bearings, National Standard Spindle m. d., in base.
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 No. 3B Milwaukee Plain, double over-arm, m. d.
 No. 2 H. D. LeBlond Plain, cone.
 Nos. 3, 4 Cincinnati Plain, cone.
 No. 3 Kempsmith Plain, cone.
 No. 3 Hendey-Norton Plain, cone.
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4⁸ American Triple Geared, m. d.
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5⁸ Reed-Prestice Plain, m. d.
5⁸ Bickford Plain, m. d.
6⁸ Dreses Universal, m. d.
7⁸ Fodick Plain, cone.

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20x144⁸ Landis Plain Cylindrical, m. d.
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No. 3 Brown & Sharpe Surface, belt.
60⁸ Springfield Face, M. D.
60⁸ Bridgeport Face, belt.
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Surface M. D. in base.
No. 33 Abrasive Vertical Surface, M.D.
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No. 3 Bryant Semi-Automatic Hole, m. d.
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No. 72A5 Heald Plain Internal, 2 m. d.
hydraulic, very late.
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3 motor drive.

More than 1500 machines in stock.

No. 1 Norton Universal Tool & Cutter, belt.
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No. 4 Landis Universal, belt.
No. 50, 55 60, 65 Heald Cylinder, belt.
6x18⁸, 10x24⁸, 10x36⁸, 10x52, 10x72⁸,
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16x52⁸, 16x72⁸ Landis Plain Self-
Contained Cylindrical, belt and motor
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6x32⁸, 10x36⁸, 10x50⁸, 10x72⁸, 12x72⁸,
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No. 24-53⁸ Gardner Horizontal Disc.
Grinder, m. d.
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No. 12, 14, 120 Gardner Disc, centertype.

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51⁸ Niles, 2 heads.
30⁸, 36⁸ Gisholt, belt.
36⁸, 42⁸ Bullard Vertical Rapid Prod.
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36⁸ Colburn, gear box, 2 heads.
37⁸ Niles Vertical, 2 heads, m. d.

GEAR MACHINERY

No. 3, 12 Barber-Colman Gr. Hobbers.
No. 12 Barber-Colman Gear Hobber,
double overarm.
No. 6 Fellows Gear Shapers, belt.
No. 5A Lers-Bradner Gr. Gener., belt.
No. 3 Brown & Sharpe Gear Cutter, belt.

PRESSES

No. 168 Toledo Toggle Drawing.
No. 1½ Bliss Cam.
No. 3A Bliss Horning.
D2, DD2¹ ferracut Dbl. Action Drawing
P2, P4 Ferracut Stiles type.
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24"x12" Lodge & Shipley.
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6' American Triple purpose.

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18"x10" American geared head.
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25"-27"x26" LeBlond.
36"x18" L. & S. Patent hd.
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54"x23" Johnson, T. G.
66"x21", 39" Putnam t.g., m. d.

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Nos. 2 & 3 Cinn. h. p., s. p. d.
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HONING MACH.; Hutto 2-spindle Vert. M. D.

KEYSEATERS; M & M No. 0 vert. Burr horiz.

LATHES; Reed-Prent. 16⁸x8⁸ grd. hd.; LeBlond 16x8⁸, Lehmann 18⁸x9⁸, Hendey 18⁸x8⁸; Amer. 22x8⁸, Whit. Blais. 22⁸x8⁸; Davis 22⁸x10⁸; L & S 20⁸x10⁸, S-B & E 20⁸x10⁸ q. c. g.

MILLING MACHINES; Ohio No. 24, Kemp. No. 3, B & S No. 3, Cleve. No. 1 s.p.d. univ. B. & S. No. 2, Amer. No. 1½, Cin. No. 3, B & S No. 3, Hendey No. 3, LeBlond No. 3, Mil. No. 3-B s.p.d. plain. Becker Model "B" & No. 6 vert.; Kemp. No. 33 s.p.d. Prod.; Ingersoll slab, m. d.

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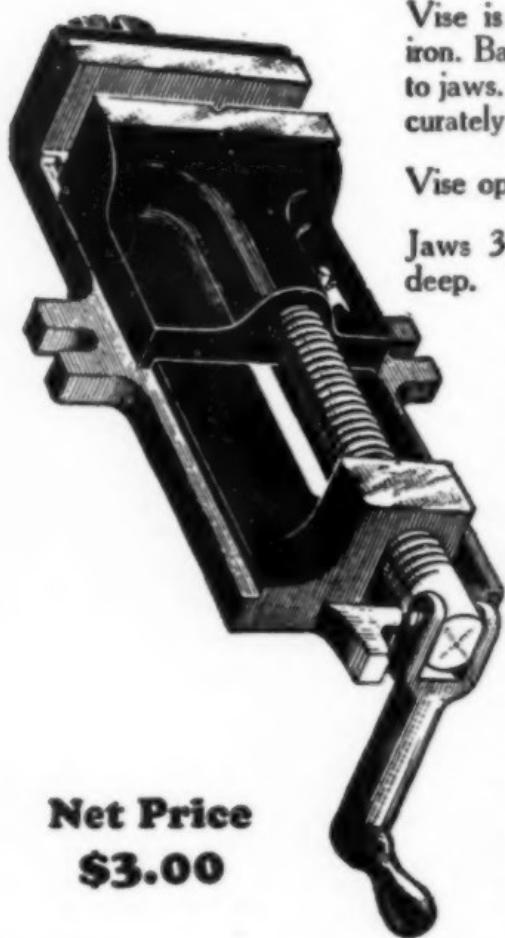
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2 spindle Leland Gifford.

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Reed center dr. Axle Lathe; m. d.
Bradford 20^x10¹ leg lathe; grd. fd.; c. d.
Bradford 20^x8¹ q.c.g.; taper att.; c. d.
LeBlond 18^x10¹ Late Type; with
turret; c. d.
Bradford 18^x8¹ leg lathe; grd. fd.; c. d.
LeBlond 18^x8¹ l.c.g.; d.c. mtr. driven.
LeBlond 17^x6¹ Mfg. Type; cone dr.
Bradford 16^x8¹ hd. q.c.g. lathe; c. d.
Willard 12^x6¹ semi-q.c.g. lathe; c. d.
LeBlond No. 9 Multi-cut lathe, s.p. d.
Chard 16^x8¹ q. c. g. Lathe; c. d.
McCabe 50-27¹ dbl. spindle Lathe,
d. e., m. d.

SHAPERS

28¹ Smith & Mills b. g. shaper; grd. m. d.
26¹ G. & E. b. g., s. p. d.
25¹ Smith & Mills plain, b. g., cone dr.
24¹ Cincinnati, b. g., cone drive.
22¹ Ohio, b. g., cone drive.
Barker 16¹ pl. crank shaper; cone dr.
12¹ Smith & Mills plain crank, b. d.

MISCELLANEOUS

Atkins No. 3 metal cutting band saw,
belt drive.
Racine 6^x6¹ cab. base saw; b.d. wet.
Racine 13^x13¹ hack saw, belt drive.
6^x6¹ Peerless H.S. Saws, b. d.
4¹<sub>2^x4¹<sub>2¹ Napier horiz. hack saw, b. d.
Fosdick No. 2-A horiz. floor type bor.
mill, b. d.
Universal 3¹₂ dia. bar, hor. bor. mill, m. d.
Lucas 4¹₂ dia. bar horiz. boring mill, m. d.
Grand Rapids No. 4 drill grinder, m. d.
Ohio No. 3 cutter & tool grinder; b. d.
Cin'ti No. 1¹₂ cutter & tool grinder; b. d.
LeBlond No. 1 cut. & tool grinder; b. d.
Bertsch 10^x10¹ Press Brake, motor dr.
American Can Co. No. 20.b.i Press b. d.
Toledo No. 3 o.b.i. Press; b. d.
Pangborn sand blast equip.; like new.
Niagara No. 252 power squar. shear;
14 ga. x 52¹; b. d.
J. & L. 2 spdl. turret lathe, g. hd.,
chuck, s. p. d.
B. & O. No. 8 turret lathe, bar, b. d.
Gisholt 21¹ tilted type turret lathes,
m. d. (2).
Chicago 9^x8¹ Air Comp.; b. d.</sub></sub>

Bellevue No. 14 indus. furn.; oil burning.
P. & W. thread mill; 6^x48¹; b. d.
Theil die filing machine, motor driven.

PLANERS

60^x60^x14¹ Cincinnati; 2 hds.; b. d.
55^x55^x30¹ Betts, spur geared 2 hds.
on rail, motor drive.
36^x36^x16¹ Gray planer, 2 hds.; bd.
32^x32^x10¹ Gray planer; 2 hds.; bd.
32^x32^x14¹ Gray planer, 2 hds.; bd.
30^x30^x18¹ Gray planer, 1 hd.; bd.
26^x26^x10¹ Gray; 2 hds.; m. d.
26^x26^x6¹ American, belt drive.

MILLING MACHINES

Rockford No. 1¹₂ plain miller; p. t.; b. d.
Ingersoll 30^x30^x20¹ milling machine;
5 heads, m. d.
Cincinnati Nos. 4, 3, 2 pl.; cone dr.
Becker No. 6 vertical h. d.; cone dr.
Brown & S. No. 1 Y Pl. Miller Cone Dr.
Brown & S. No. 0 Y Pl. Miller cone dr.
Garvin No. 12 Miller; c. d.

GRINDERS

Gardner No. 2 b. b. disc grinder; b. d.
B. & S. No. 26 plain cylindrical; b. d.
B. & S. No. 11 plain cylindrical; b. d.
No. 2 Diamond surf. grinder, motor dr.
Ott No. 8 plain cyl. Grinder; 6^x18¹
belt drive.
Modern 12^x24¹; pl. cylindrical; b. d.

Heald No. 60 Internal Grind.; b. d.
Landis No. 1¹₂ universal & tool; b. d.
Heald No. 65 Internal gr.; b. d.

DRILLS, Radial & Sensitive

American 3¹ triple purp. radial; s. p. d.
American 6¹ triple pur. radial drill, m. d.
Bausch 8-sp. multi drill; No. 3 mt; pd.
Fairbanks 20¹ stat. hd. drill; bg; pf; bd.
Fosdick 3¹ Radial; 48¹ arm; s. p. d.
8-spindle Moline hole drill, cone drive.
3¹₂' Cinti-Bick. RC radial, d.e., m. d.
Cinti-Bick. 3¹ radial dr.; d. e. with mtr.
Mueller 4¹ radial, extend. column, s. p. d.
Fosdick 5¹ box column radial, s. p. d.
Colburn No. 2 hi duty; t. & l. pul. dr.
Baker No. 310 hvy. duty, belt driven.
Foote-Burt hd. prod. 4-sp. drill; pf;
s. p. d.

Foote-Burt No. 25 h. d.; sgl. pul. dr.
Foote-Burt 4-spindle rail type; b. d.
Barnes camel back 2-spindle; belt dr.
Barnes 3-spindle 20¹; p. f.; belt dr.
Avey No. 3 b. b. sens. drill; m. d.
Avey No. 1¹₂ high speed 6-sp. drill; b. d.

THE E. A. KINSEY CO.

333 West Fourth St.,

Est. 1886

Cincinnati, O.

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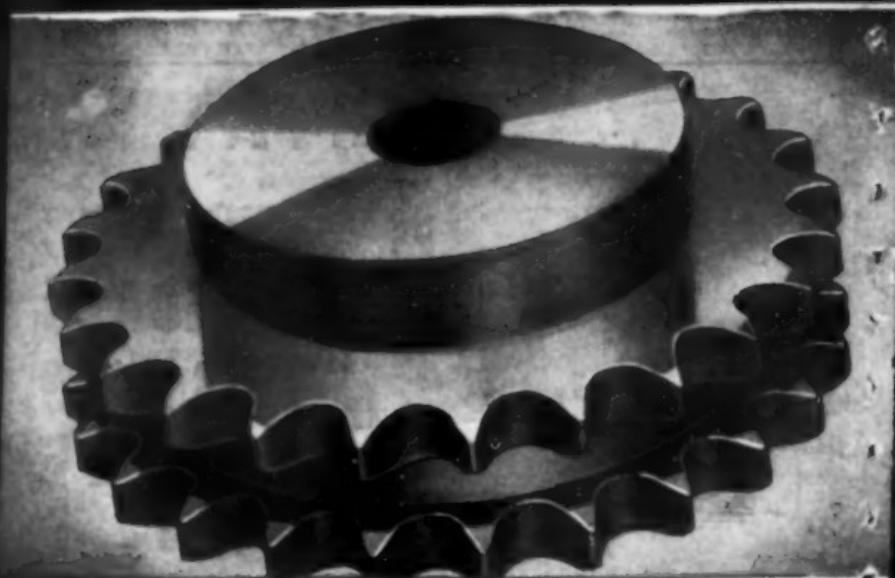
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